2013

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UNIVERSITY OF WOLLONGONG

**Faculty of Engineering and Information Sciences**

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# E-Government Continuance from an Expectation Confirmation Theory Perspective: Survey Research on Citizen Experience

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**This thesis is presented as part of the requirements for the award of the Degree of Doctor of Philosophy University of Wollongong**

**2013**

## CERTIFICATION

I declare that this thesis is my own work unless otherwise referenced or acknowledged. This document has never been submitted for a degree at any academic institution.

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2887782
2013

## ABSTRACT

Electronic government (or, e-government) aims to provide comprehensive and timely public services to citizens through the adoption, use and management of information and communication technologies (ICTs) in government. In this thesis I hold that e-government benefits realization, therefore, critically depends on citizens' satisfactory experience and "continuance" (or, continuing use) of e-government services. Despite the rapid growth in e-government research and practice, problems of low-level e-government use, especially more advanced transactional services, have not been systematically studied in e-government research literature.

To fill this gap, this empirical research draws from Oliver's (1980) expectation confirmation theory and IS continuance literature to develop a better theoretical explanation for the problem of low-level e-government use. The "IS continuance" research finds "the substantive differences" in construct between initial IS adoption/use and IS continuance over time. This research has constructed a new research model for citizens' continuance of e-government services. Furthermore, the new research model was empirically tested using a structural equation modelling (SEM) approach in the research context of Saudi transactional e-services provided via the Saudi Ministry of Higher Education's integrated interoperable portal. An online survey collected 846 survey returns from 8,175 Saudi citizens, who comprise the entire population of Saudi students studying in Australia.

SEM and multiple regressions analysis results indicate that 42% of the variance of e-government continuance is explained by the model constructs. SEM results provide strong evidence for statistically highly significant positive correlations between citizens' continuance of e-government services and three of its antecedents: service quality, user satisfaction, and intention to use. While statistically significant, an antecedent, habit, is not found to strongly associate with e-government continuance. I hold that the research findings have public policy implications. Government needs to pay greater attention to e-service governance and strategic management of both government supply-side (quality of e-government services to citizens) and citizen demand-side (intention to use and satisfaction with e-government services) which are both technological and organizational policy issues in order to enhance and sustain citizens' continuing use of e-government services for greater e-government benefits realization.

## ACKNOWLEDGEMENTS

I wish to greatly thank my God “Allah” for giving me the strength to finish this research.

Next, I would like to thank my supervisor, Dr. Akemi Chatfield, for her continuous support.

I also would like to thank my parents, my wife Amani, for all their wonderful support. I appreciate the warm and cheerful support I have received from my daughters Seba, “Susi” and Reema.

Finally, I wish to thank my friends, especially Ibrahim Alseadoon and Fouad who helped me and cheered me up when I needed it.

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## ABBREVIATIONS

| | |
|---|---|
| CITC | Communication and Information Technology Commission |
| ECT | Expectation Confirmation Theory |
| G2B | Government to Business |
| G2C | Government to Citizen |
| G2E | Government to Employees |
| G2G | Government to Government |
| ICT | Information and Communication Technology |
| IS | Information Systems |
| MCIT | Ministry of Communications and Information Technology |
| MOHE | Ministry of Higher Education |
| OPEC | Organization of the Petroleum Exporting Countries |
| SACM | Saudi Arabia Cultural Mission |
| SAUDI | Saudi Arabia National Portal |
| SEM | Structural Equation Modelling |
| WTO | World Trade Organization |

# CHAPTER 1: INTRODUCTION

## 1.1 Introduction

This chapter aims to present a brief overview of this doctoral research on the "continuance" (or continuing use) of e-government services in the research context of Saudi e-government. This chapter will provide a background to the research problem and identify the research questions that will be empirically examined through a very large-scale online survey of Saudi citizens and e-government users. This chapter will also present the objectives and significance of and the motivation behind, this research. Then it will present the methodology, contributions, and limitation of this research. It concludes with an overview of the content of each chapter in this thesis.

## 1.2 Background of the research problem

E-government is defined as "the use of information and technology to support and improve public policies and government operations, engage citizens, and provide comprehensive and timely government services" (Scholl 2007, p. 21). Based on the existing information systems (IS) "continuance" literature, there is no unified definition of IS continuance. However, Bhattacherjee (2001, p. 351) helped to explain continuance, saying the "long-term viability of an IS and its eventual success depends on its continued use rather than first-time use". Also, Limayem *et al.* (2007) view IS continuance as behavioural patterns reflecting continued use of a particular IS.

The primary goals of the nations across the world include sustainable economic development, public service delivery, policy formulation and regulation. In order to achieve these goals, many of these nations, even the developing nations, have adopted and implemented electronic government (or e-government) services for their key stakeholders: citizens, businesses, governments, and public-sector employees (United Nations 2012).

E-government provides government with many potential benefits. Good government performance is unlikely without the provision of e-government services to the many stakeholders (Reddick 2009). For example, well designed and implemented e-government

can deliver more efficient services to the users (citizens, businesses and other parties), better comply with government regulations and enhance citizen engagement with government. In addition, e-government can reduce the cost of the service process for the government and the users alike (Al-Nuaim 2009). E-government can be a solution for the increasing demand for more accountability, transparency and efficiency when citizens or businesses interact with the government (Zambrano 2008; Chun *et al.* 2012).

The government of Saudi Arabia realizes the significance of the e-government concept and the role of e-government to serve the Saudi citizens. Therefore, the supreme Royal Decree of 7/9/2003, directs the Ministry of Communications and Information Technology (MCIT) to formulate a plan to provide public services and transactions electronically through the implementation of e-government. Transforming government to e-government is hard to achieve without wide collaboration and intensive efforts to achieve the e-government objectives. Thus, MCIT established the e-government program in 2005 in conjunction with the Ministry of Finance and the Communication and Information Technology Commission (CITC). As a result of this collaboration, the 'Yesser' program was launched.

The Saudi Arabian e-government program called 'Yesser' was launched in 2006 to achieve specific objectives. Firstly, the Yesser program aims to improve public sector productivity and efficiency. Secondly, Yesser should provide better and more easy to use services for individual and business customers. Also, Yesser should help to increase the return on investment. Finally, the Yesser program aims to provide the required information in a timely and highly accurate manner (Yesser 2012a). The Yesser program plays the role of facilitator, enabler and motivator for e-government implementation in the public sector.

Today Saudi Arabia ranked 9$^{th}$ in Asia and 41st worldwide in e-government readiness ranking (United Nations 2012). Although great efforts were put into making the Saudi e-government a reality, there is a low level of use of the Saudi e-government services. However, the Saudi government is not alone. The problem is shared by many developed countries. In the UK, where nearly two-thirds of Britons have Internet access, only 5% of them regularly use government websites to access public services (Aichholzer 2004). According to the United Nations (2012), the level of e-government usage is generally low. In the European Union's (EU) 27 countries, the average usage rate is only 32 percent,

whereas in Organisation for Economic Co-operation and Development (OECD) countries, the average usage rate in 2010 was only around 40 percent, even though there had been recent increases in citizen take-up of e-services (Wang 2009; United Nations 2012). An example of the low use of e-government is in Lithuania (an EU country), where the Internet penetration is almost 70 percent, however, two thirds (66 percent) of the country's residents have never used e-government services (Pavilenene 2011; United Nations 2012). Therefore, the problem of low level e-government use is a worldwide problem even within the developed countries.

Despite the rapid growth in e-government research and practice, problems of low-level use of e-government services, especially more advanced financial transactional services, and its impact on low-level e-government benefits realization, have not been systematically studied in the e-government research literature. In this context, low-level use means a low-level number of users of e-government services and it also means a low-level use of available functionalities and services. Chatfield (2009) argues that low-level e-government benefits realization may be explained by the lack of available transactional citizen-centric e-services, such as e-Tax, through e-government websites and portals. As long as government only offers low-level functionalities through e-government, such as "forms download", transformational e-government benefits are difficult to achieve (Irani *et al.* 2007b).

To fill this gap, this empirical survey research, which is grounded in Expectation Confirmation theory (Oliver 1980), aims to develop new theoretical explanations for the problem of low-level use of e-government services by integrating the existing information systems (IS) "continuance" literature and developing a new research model for citizen continuance of e-government services. Expectation Conformation theory (ECT) is a theory with explicit focus on a user's psychological motivations that emerge after initial adoption (Limayem *et al.* 2007; Chou *et al.* 2012). ECT is employed because it is widely used in the consumer behaviour literature to study consumer satisfaction, post-purchase behaviour (e.g., repurchase, complaining), and service marketing in general (Bhattacherjee 2001; Chang & Zhu 2012; Chen *et al.* 2012; Lin *et al.* 2012; Stone & Baker-Eveleth 2013; Terzis *et al.* 2013). In addition, ECT was extended by Bhattacherjee (2001) from the consumer behaviour literature to theorize a model of IS continuance which is commonly referred to

in the IS field as the Expectation Confirmation model (ECM). In this study, Expectation Confirmation theory is adapted from the consumer behaviour literature and integrated with theoretical and empirical findings from prior IS usage research to theorize a model of IS continuance.

## 1.3 Research questions

This research aims to address the following questions:

1. What are the key factors that influence e-government continuing use in Saudi Arabia?
2. How strongly do these factors influence citizens to continue using e-government services?

The two research questions will be addressed through an online survey methodology in the context of Saudi e-government, which will be discussed in the next chapter. The choice of Saudi e-government is strategic. At a national level, like many other countries, Saudi e-government also faces the problem of low-level use by citizens. At a personal level, I am a Saudi citizen, I speak Arabic, have an expert knowledge of Saudi e-government, and have access to the survey population of Saudi students studying in Australia.

## 1.4 Research objectives

The overarching goal of my research is to develop a research model for conceptualizing and explaining citizens' continuance of e-government services. The research model will be empirically tested in the context of Saudi Arabian e-government. It is hoped that the validated research model will be able to address the low-level use of e-government in Saudi Arabia and elsewhere. The objective of this research is to increase theoretical knowledge and understanding of continuing use of e-government by extending the existing Expectation Confirmation Theory under a specific context (e-government in Saudi Arabia) and to understand the factors that influence e-government continuance. In addition, this thesis will develop a theoretical model of antecedents of e-government continuance and test the model empirically against the online survey data collected from a sample of citizens about their experience of Saudi Arabia's integrated e-government services.

## 1.5 Research significance and motivation

While there are many studies in the e-government research field, most of these studies explore the adoption of e-government, which failed to investigate citizens' continuing use of e-government beyond the initial adoption stage. Therefore, there is the gap in the literature about theoretical explanations for the problem of low or limited e-government use, particularly given the fast growing provision and availability of e-services (OECD 2009; United Nations 2012). In other words, the existing studies are taking only a snapshot of the adoption of e-government. These studies fail to address more difficult issues of long-term engagement between e-government and citizens. Wangpipatwong *et al.* (2009) claimed that while initial use of e-government Web sites is an important indicator of e-government success, it does not necessarily lead to the desired outcome, unless a significant number of citizens move beyond the initial adoption stage and use e-government Web sites on a continual basis.

Thus, governments should consider the importance of citizen's awareness of e-government websites and look into the significant factors influencing citizen's continuance to use e-government website (Wangpipatwong *et al.* 2008). In addition, there is a lack of studies that empirically investigate the continued use of e-government, and how this contributes to e-government service sustainability (Detlor *et al.* 2013). "Government initiatives to implement ICT will not alter the state of digital inequality unless there is continued use" (Hsieh *et al.* 2008, p. 98). Long-term viability of an information system (IS) and its eventual success depend on its continued use, rather than its first time use (Bhattacherjee 2001). Limited attention has been directed toward examining post-adoption stages of the information system life cycle (Furneaux 2011). If management wants to promote continued IS usage behaviour, it clearly needs to understand what drives it (Limayem *et al.* 2007). According to recent research by the European Commission, the different speed and growth rate between e-service availability and e-service take-up is substantial. In addition, there is a significant trend in the figures, suggesting that there is limited correlation between the provision of e-government services and their sophistication.

There is heavy investment in information technology to support work processes. However, available evidence suggests the functional potential of these installed IT applications is

underutilized, and most of the users are using a narrow band of features, operate at low levels of feature use, and rarely initiate extensions of the available features (Jasperson *et al.* 2005). "Before an IS implementation can truly be considered as a success, a significant number of users should have moved beyond the initial adoption stage, using the IS on a continued basis" (Limayem *et al.* 2007). The final stages of the information system life cycle, 'post-adoption stages', have been largely ignored, despite the fact that most systems eventually reach the end of their useful life. This ignorance can have significant implications for user effectiveness, the value extracted from IS investments, and organizational performance (Furneaux 2011).

There is no comprehensive data available to assess citizen usages at the global level (United Nations 2012). Data are not yet systematically collected and uniformly available across countries around the world (United Nations 2012). Thus, this study has practical application for public administrations who may wish to improve or promote the use of e-government services by citizens and other stakeholders. This thesis will fill this gap, and go beyond the adoption of e-government to the continuing use of e-government. In other words, this study will empirically investigate the drivers behind the continued citizen use of e-government. The results of this study may interest the following groups:

1- Any government officials who are responsible for e-government implementation and adoption. In fact, this study is very important for government officials who want to ensure the continuing use of e-government services.

2- Researchers who are interested in the e-government area.

### 1.6 Research methodology

In order to answer the research questions, this research will develop a model for e-government continuance which is grounded in Expectation Confirmation theory (in the marketing context, Oliver (1980)) and Limayen's model (Limayem *et al.* (2007) in the IS context). Hypotheses in the model will be empirically tested using a quantitative approach. The nature of the research problem requires collecting and analysing quantitative data to test the relationships between the different variables of the research model.

The data will be collected using an online survey. The online survey was chosen because of the nature of the research sample which is spread over a vast area. The sample is the Saudi students who are studying in Australia. It is known that Australia is a very vast country. Those Saudi students are spread across many cities and towns all over Australia. Thus, the online survey is the best choice. Those students are asked about their views of using the Ministry of Higher Education portal.

## 1.7 Research contributions & limitations

This research, which aims to understanding the antecedents of e-government continuance, is important in e-government research, because continuance is expected to translate into substantial value creation, such as savings in operating costs and improvements in user satisfaction. It is also expected to provide new theoretical understanding and public policy implications for long-term sustainability of e-government initiatives, particularly for developing countries. By studying the continuance of e-government we can develop a better theoretical understanding of the reasons behind low levels of e-government use. This research will contribute theoretically to the emerging body of the literature by developing and empirically validating a conceptual model, which extends the Expectation Confirmation Theory with a set of new variables found in information systems literature. This research will contribute to both IS continuance research and e-government research, by reducing the knowledge gap identified earlier. Importantly, this research will have real-world impacts on enhanced practice in e-government services by providing government decision-makers and policy makers with new insights into sustainable e-government services and enhanced citizen experiences.

## 1.8 Thesis outline

The structure of this thesis is as follows:

Chapter 2 describes the e-government in Saudi Arabia. This background chapter provides a complete picture of the Saudi e-government in general and the e-government services in the Ministry of Higher Education in particular.

Chapter 3 presents a review of the literature on the research problem and the key issues relating to the research questions.

Chapter 4 describes and explains the development of the research model.

Chapter 5 explains the methods, techniques, and tools used to answer the research questions. This chapter also shows the scale reliability and validity process.

Chapter 6 reports on data collection used to test the research model. It also shows the findings from the research hypothesis testing.

Finally, Chapter 7 presents a discussion of the research results and the implications of the study for research. This chapter also discusses the limitation of the research and provides recommendations. It also provides recommendations to the Saudi government. Finally, it presents the research conclusion.

# CHAPTER 2: RESERCH CONTEXT: E-GOVERNMENT IN SAUDI ARABIA

## 2.1 Introduction

Saudi Arabia, founded upon the Islam religion since 1932, is governed by an absolute monarchy. Hence, the King of Saudi Arabia is both head of state and the head of government, while high-level policy decisions are, to a large extent, made on the basis of consultation among the senior princes of the royal family and the religious establishment. King Abdullah Bin Abdul-Aziz, the current king, has reigned since 2005. In 2009, he restructured the cabinet to appoint moderates to hold ministerial and legal positions, and appointed the first female to the cabinet. In February and March 2011, King Abdullah announced a series of new benefits to the Saudi citizens, including financial support to build affordable housing, salary increases for government employees, and unemployment benefits. The Saudi government held elections nationwide in 2011 to elect half of the members of municipal councils. Furthermore in September 2011, the king announced that women will be permitted to run for and vote in future municipal elections. The country still is a leading producer of oil and natural gas and holds more than 20% of the world's proven oil reserves (CIA Factbook 2012).

## 2.2 Background of Saudi Arabia

Saudi Arabia is located in the southwest corner of Asia, Saudi Arabia is at the crossroads of Europe, Asia and Africa. It is surrounded by the Red Sea from the West, Yemen and Oman from the South, the Arabian Gulf and the United Arab Emirates and Qatar from the East, and Jordan, Iraq and Kuwait on the North. Saudi Arabia's Red Sea coastline stretches about 1,760 kilometres while its Arabian Gulf coastline is roughly 560 kilometres long (Saudi E-government National Portal 2012). The total population of Saudi Arabia is 27,136,977 people. According to 2010 statistics, 69% of the population were Saudi citizens, the growth rate of the total population between 2004 and 2010 was 3.2%, and the population density was 14 people/ $km^2$. The 2010 GDP rosed by 3.76% in a year, the private sector contributed at a rate of 47.8% of total GDP, while the GDP per capita at the present prices reached 60,000 Saudi Riyal (SAR). Furthermore, the gross enrolment rate in

primary education in 2009 achieved 99%, and the infant mortality rate for that year reached 17.3 per thousand live births, while the unemployment rate among Saudi citizens in the same year reached 10.5%. (Saudi E-government National Portal 2012).

The Saudi Economy is an oil-based economy with tight government controls over major economic activities. Saudi Arabia holds about one-fifth of the world's proven petroleum reserves. It ranked as the largest exporter of petroleum worldwide, and plays a primary role in the Organization of the Petroleum Exporting Countries (OPEC). The petroleum sector accounts for roughly 80% of budget revenues, 45% of GDP, and 90% of export earnings (Saudi Ministry of Finance 2011). However, Saudi Arabia now promotes the development of other private-sector industries in order to expand its economic diversity and to create more jobs for the citizens. Information technology diversification efforts are concentrating on the power generation, telecommunications, natural gas discovery and petrochemical sectors.

Approximately 6 million foreign workers play an important role in the Saudi economy, mostly in the oil and service sectors, while the Saudi government is struggling to reduce unemployment rates among its own citizens (CIA Factbook 2012). In consequence, Saudi officials are mainly focused on employing a large population of young citizens, who commonly lack the technical skills that are needed by the private sector. The Saudi government has substantially increased spending on job training and education. The number of Saudi students who are sponsored by the government to study overseas to acquire these skills is 149,000 as at the end of 2012 (Ministry of Higher Education 2013). Recently, the government opened the King Abdullah University of Science and Technology, which is the first Saudi Arabian co-educational university. As part of the Saudi effort to increase foreign investments, Saudi Arabia acceded to the World Trade Organization (WTO) in December 2005 after many years of negotiations. The Saudi government has begun creating 6 economic cities in diverse regions of the country to encourage foreign investment. Another strategy is to spend $373 billion between 2010 and 2014 on social development and infrastructure projects, to improve Saudi’s economic development (CIA Factbook 2012).

The 2012 Saudi budget projections include SR702 billion in revenues (187 billion USD), SR 609 billion (162 billion USD) in expenditure and a SR 12 billion (3.2 billion USD) surplus. According to the Saudi Ministry of Finance (2011), the spending on higher education and training reached US$40 billion in 2011. Figure 2.1 shows a steady increase in investment in education and training from 2004 to 2011. There has also been a focus on development projects, particularly in education, health, security, social, municipal, water and sewage services, roads, e-services and support of research. The budget consists of new programs and projects, and additional phases of existing projects that have been previously approved at approximately SR 265 billion in total (Saudi E-government National Portal 2012).

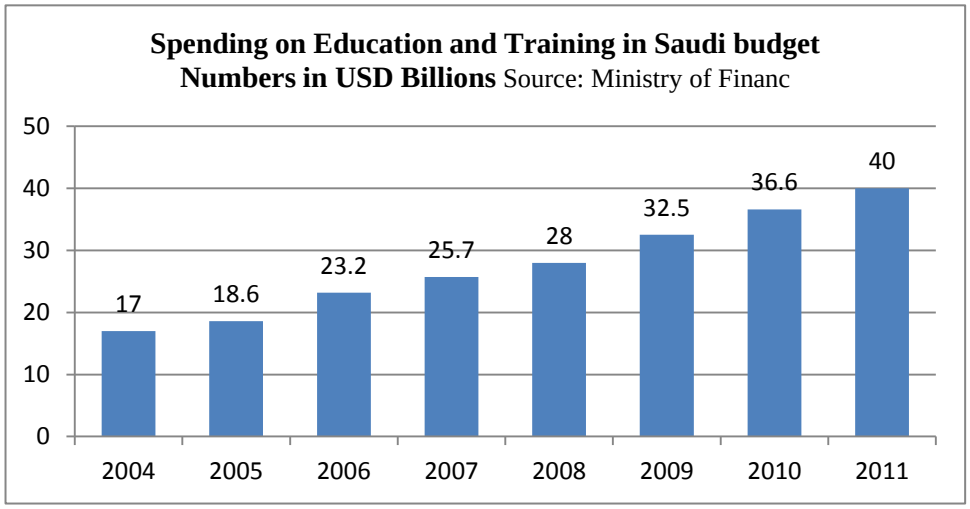


Figure 2.1 Saudi government investment in education and training

## 2.3 E-government supply-side and demand-side perspectives

In his analysis of the evolution of e-government adoption studies, Reddick (2005) identifies two emergent e-government perspectives: the supply side and the demand side. On the one hand, the supply side perspective is a government-centric view of public services policy, provision, and delivery. More specifically, this perspective views government as the supplier of public services and rather exclusively focuses on public service offerings, usually without engagement and consultation with the users, including citizens. On the other hand, the demand side perspective is a user-centric view of public

services, and therefore, it aims to understand the demands of the users of e-government, and to identify how citizens engage and interact with e-government (Reddick 2005).

Much of the existing studies on e-government adoption and use have explored it from a supply-side perspective. In his surveys of what governments offer online, Reddick (2005, p. 42) has documented evidence and concluded that "the demand side perspective has been relatively unexplored".

## 2.4 Saudi E-Government from supply-side perspective

### 2.4.1 The current status of ICT in Saudi Arabia

According to Waverman *et al.* (2011), Saudi Arabia shows an extraordinarily strong performance in its telecom sector. As shown in Figure 2.2, over $10 billion was invested in 2009, exceeding the levels of richer and more populous countries, such as the UK, by handsome margins. Looking at the trend in investment in Saudi Arabia over time, we can see that there has been sustained, strong investment and a major ramp-up in recent years, probably reflecting broadband and advanced mobile network deployment. A major factor in accelerating mobile investment is likely to have been the introduction of new mobile networks in the mid 2000s.

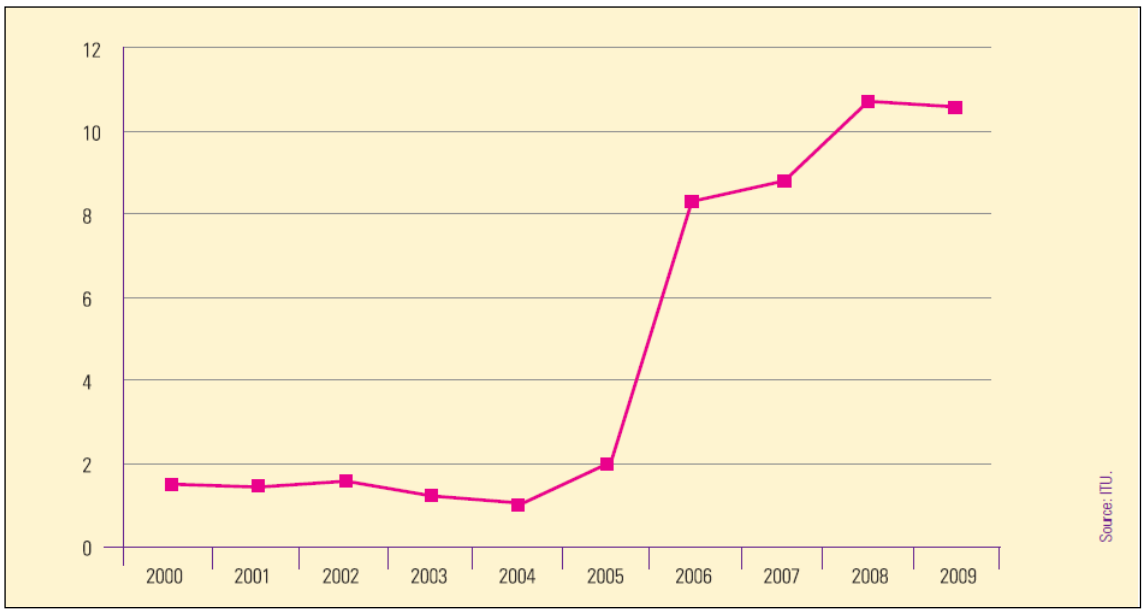


Figure 2.2 Annual Saudi Arabia telecom investment (billion,USD)

A number of indicators are usually used to show the prevalence of the basic elements of the ICT status. Some of these indicators are; including the number of fixed phone lines, the number of mobile phone lines, the number of personal computers and the number of Internet users per 100 inhabitants.

According to Ministry of Communications and Information Technology (2012), the total number of mobile subscriptions grew to around 54.5 million by the end of 2012, with a penetration rate of 187.5%. Mobile prepaid subscriptions represent the majority (over 86%) of all mobile subscriptions. Fixed telephone lines stood at 4.66 million by end of 2012, of which around 3.3 million (71%) were residential lines. This represents a household telephone density of around 68.1%, while the population telephone density is about 16%. The rate of demand for fixed line service has been relatively stable since 2004. The main reason is the rapid spread of mobile telecom services, ease of subscription, and the gradual decrease in prices; which has led to the lower number of requests from consumers for a fixed service. However, the demand for fixed services, especially in major cities, is expected to grow as a result of growing demand for broadband services, especially for the fibre optic network services.

In addition, there has been a significant increase in society's demand for broadband services recently, compared to previous years. In response, the government has provided strong support for high technology projects, which require an infra-structure which will allow the provision of digital goods, especially now that many government activities are made through e-government transactions. The total subscriptions to the mobile broadband reached 12.62 million by the end of 2012, representing a population penetration rate of 43.4%. The key reasons for this growth are the vigorous competition, an expansion of smart phones and offers of various data packages by mobile operators. It has become easier to access this technology via mobile devices such as smart phones. The mobile networks will improve, as the 3.5G continues to be deployed and as wireless broadband technologies (4G) emerge over the next few years.

The estimated number of Internet users is 14.7 millions at the end of 2012. Internet penetration has increased to 50.7%. It is expected that the demand for Internet services will

increase significantly in the next few years due to the availability of optical networks (FTTx) at very high speeds, especially in large cities initially, growing Internet content, and the spread of handheld smart devices and applications.

### 2.4.2 E-government in Saudi Arabia

According to the United Nation E-Government Reports (2003, 2012), Saudi Arabia moved from the 105$^{th}$ position in 2003 to the 41$^{st}$ position in 2012. The 2012 Report (p. 12) considers Saudi Arabia as one of the "*emerging leaders"* in e-government development. It also describes the Saudi e-services as "*innovative"* services (p. 27). In addition, a big development in the Saudi e-services is the national portal, "which verifies the identity of the citizen (Digital Verification) and serves as a single sign-on portal where citizens can access all services provided"(p. 27). The Saudi Government also offers an "Open Data Initiative", which provides citizens with documents and reports from ministries and government agencies, all publicly available. "It encourages e-participation to gather public opinion through surveys, public consultations and blogs". In addition, Saudi Arabia's national portal is described as one which easily connects its citizens to the online services of various government agencies, for such purposes as obtaining personal documents, filing complaints, utilizing business services and paying utilities.

The Saudi Arabian government has been investing heavily in e-government development. However, despite the availability of many online services, there has been low-level use of these services. The low-level use problem was identified by Limayem *et al.* (2007) in the IS research field. They argue that while much has been written about the importance of IS adoption, most of current IS researchers do not offer much insight into what happens beyond the adoption intention and the initial adoption. The same is true of Saudi e-government services.

### 2.4.3 E-government initiative: 'Yesser'

The national government of Saudi Arabia aims to transform the kingdom into an information society through a number of major national initiatives. One such critically important initiative is to develop and implement e-government services to benefit the national economy and the welfare of its citizens.

The Saudi Arabian e-government strategic initiative, 'Yesser', was launched in 2006 to achieve at least four objectives. Firstly, the Yesser e-government strategy aims to improve public-sector productivity and efficiency. Secondly, it aims to provide better, more convenient, and more seamlessly integrated e-government services for citizens and business customers. Thirdly, Yesser e-government strategy intends to improve government performance by increasing the return on investment (ROI). Finally, it aims to provide government information to stakeholders in a timely and highly accurate manner (Yesser 2012a). As the national e-government strategy, Yesser plays the roles of facilitator, enabler and motivator for e-government implementation across public administrations. To fulfill these roles, the national government adopts a decentralized, co-ordinated governance form, while maintaining a minimum level of centralization and coordination of various government agencies. Yesser also includes e-government implementation action plans, e-government priorities, the necessary policies and governance frameworks, standards for the specifications of e-government systems, and guidelines for government agencies to implement their own e-government portals and projects, including business process re-engineering and process chains integration (Yesser 2012a).

The 'Yesser' initiatives include the task of developing and implementing these plans and strategies in collaboration with government agencies. The first strategic plan, aimed at the five-year period of 2006 to 2010, was completed. It was to improve the productivity and efficiency of public sector service performance, to provide better public services for citizens and businesses, to increase returns on investment, and to provide timely and accurate government information to stakeholders. Now the government is implementing the second strategic plan for the five-year period of 2011 to 2015. The second strategic plan includes *e-government service transparency* and *citizen empowerment*, by increasing the citizens' awareness level of various e-services and information and knowledge sharing with respect to e-government services (Yesser 2012a). The Yesser e-government strategy, and the two five-year e-government strategic plans, show that the government wants to empower the citizens by increasing citizens' use of the Saudi e-government services through the Saudi E-government National Portal, "Saudi".

The Yesser program helps the government agencies to have more transparent workflows, which will allow any employee to know his role inside the agency. Yesser also helps the

government agencies to standardize the work processes inside the agency, and allow the use of printed electronic forms, initially just to make it easier for the agencies to change their established organizational routines and processes. Furthermore, with Yesser pushing towards the fast development cycle, many agencies started to develop a very basic webpage; whereas others managed to develop a more advanced website full of information about the agency and downloadable forms. Some agencies even developed e-services portals connected to their website. While these rapidly developed and disjointed e-government developments enabled more e-services to become available, they have created confusion for e-services users because of the lack of planning in some agencies. For example, some e-services are hard to find inside the agencies' portals and others do not describe how to use their e-services.

### 2.4.4 SADAD payment system initiative

SADAD Payment System (SADAD) was launched in 2004 by the Saudi Arabian Monetary Agency (SAMA) as the national Electronic Bill Presentment and Payment (EBPP) service provider for Saudi Arabia. The core mandate for SADAD is to facilitate and streamline bill payment transactions of end-consumers through all channels of the Kingdom's Banks. Figure 2.3 below shows the SADAD model.

SAMA works through a single platform that links different billers and banks to enable consumers to use the electronic channels of any bank. SADAD now facilitates the payment of high volume periodic/repetitive bills (e.g. utility bills, phone bills etc), and customer initiated payments, such as traffic fines, etc.

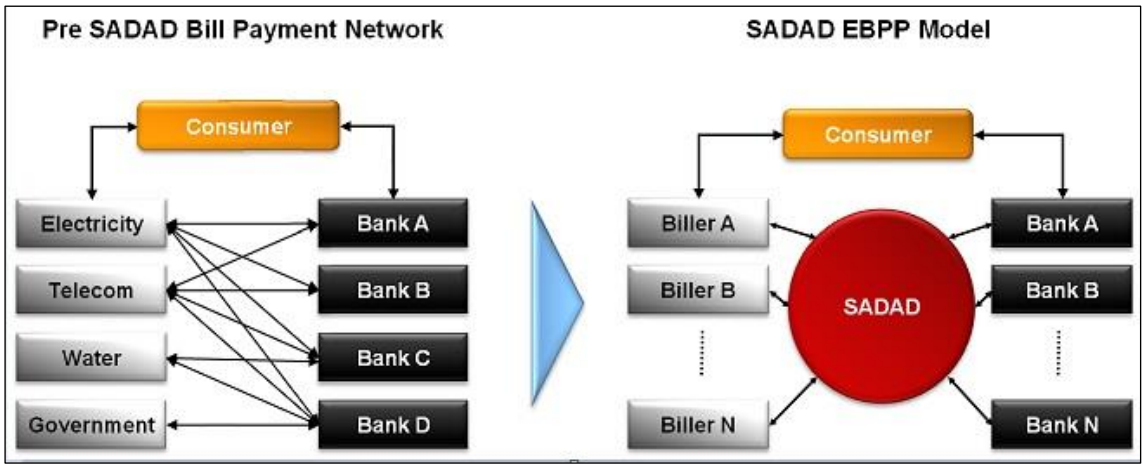


Figure 2.3 SADAD model

The SADAD Payment System (2012) has the following objectives, among others:

- To construct and operate SADAD infrastructure to ensure robust integration, resilience and operation for processing payments with high efficiency, traceability and professionalism.
- To strive for continuous improvement and expansion of the SADAD payment system for the provision of new services.
- To operate the SADAD payment system effectively in a cost effective manner.
- To develop a future plan for the SADAD payment system that promotes optimal use by citizens, businesses and governments.

### 2.4.5 Saudi e-government National Portal

The Saudi E-government National Portal (2012), "Saudi", is the central Saudi Arabian government portal, launched in 2006, which provides access to e-government services online not only for citizens, residents, businesses and visitors but also for other government organizations and businesses. This integrated portal approach has been chosen as the best way to make e-services accessible anytime and anywhere, both through the Internet and smart mobile phone devices. Broader e-service accessibility is achieved further by integrating portals operated by Saudi Ministries, government agencies, and providing links to websites of external stakeholders, such as domestic universities and overseas banks.

Over a short period of time, many government agencies started to have a very basic informational webpage. However, some agencies developed an interactional website with a wide range of government information and downloadable forms, while other agencies even developed e-service portals connected to their website. The rapid rate of e-government developments across the diverse government agencies, without a strategy or a good governance structure, resulted in serious confusion on the part of citizens as well as on the part of government employees. In consequence, the Yesser began promoting citizen-centric integrated interoperable e-government services, starting with the Saudi E-government national Portal as a central hub for all government services.

In addition, the National Portal provides:

- Frequently updated news and information about new e-services provided by government agencies
- A directory of government agencies
- Links for Saudi regulations, laws, plans and initiatives.

Saudi Arabia implemented "Saudi" to radically improve government transparency in providing public services and accessibility to existing e-government services, which were then delivered through a wide range of disjoined portals, operated by different government agencies, in order to empower citizens and other stakeholders. In order to achieve the initial goals of transparency and accessibility, the national government has paid much attention to achieving highest technical standards for implementing integrated and networked portals, to inter-connect the different e-government services provided by government agencies. For example, the Portal's administration has adopted "W3C standards" in compliance with WCAG 2.0 Standards on content accessibility, and the World Wide Web consortium with reference to usability and accessibility. Saudi Portal is completely compatible with browsers such as (Internet Explorer and Firefox). A prime example of better citizen accessibility can be found in the prominent features of "Saudi", which include its attention to disabled users, by providing a set of new functionalities designed to help a larger proportion of the disabled population to interact with the National Portal with greater ease.

The Portal's administration has introduced an innovation that would enable citizens to browse most pages of the National Portal easily, using shortcut keys. Furthermore, to expand the range of its users, all the content published on "Saudi" has been translated into English, so that non-Arab users who do not know Arabic can use public e-services. Additionally, the Portal includes a wide range of Web 2.0 visual files, graphic illustrations and photos to promote citizen engagement with Saudi public administrations and services.

"Saudi" organizes all the government's e-services in categories based on the beneficiary or based on a particular government agency. It also provides a search engine of any e-services. By doing so, it brings all the government agencies that offer e-services in one virtual sphere. The power of the Saudi E-government National Portal is that it helps government agencies to be more transparent to the civic users. This greater government transparency is achieved through the provision of information about all the government agencies with detailed information about all their e-services. In addition, 'Saudi' portal also provides information about the workflow of every e-service and the documents and information required for completing these service transactions. It gives the users of the e-services a clearer and more transparent view of how the government agencies operate and provide public services. It also plays an important role of educating the general public about the e-services provided by the different government agencies. In fact, this will increase the awareness of these services, which will in turn increase the level of use. The public awareness of the e-government services is one of the challenges of the Saudi e-government (Al-Fakhri *et al.* 2008). The government uses the 'Saudi' portal to advertise for its services in all government agency websites, inside the buildings of the agencies and even on bulletin boards in some popular places in the cities.

As discussed, the Saudi E-government National Portal 'Saudi' played an important role in improving government transparency. In fact, it radically changed the traditional ways of doing business with government. Before the introduction of the National Saudi Portal 'Saudi', the Yesser was prompting government agencies to develop e-services without a comprehensive roadmap of across-agency workflows and without any detailed procedural guidelines about how public services should be performed. To make the matter worse, some government agencies did not have an e-government website. The provision of public services depended on government employees' own experiences. The general guidelines,

which lacked sufficient specificity, often resulted in differences in service quality and outcomes for the same service demanded by different citizens. In addition, government agencies usually required citizens to visit the information desk to understand the procedure and for the required documents, which was an added inconvenience from a citizens' perspective.

### 2.4.6 Saudi e-government strategic plans

Saudi Arabia has taken consecutive steps to develop business processes and to disseminate the concept of e-services in different government agencies. So, Saudi Arabia adopted a set of ambitious plans and strategies. The e-government program has been assigned the task of developing and implementing these plans and strategies in cooperation with government agencies. The first action plan, which covered 2006 to 2010, has been completed. Now the government is executing the second action plan, which will extend from 2012 to 2016 (Yesser 2012a).

The Yesser articulates the national e-government strategy for improving governance at the national level to motivate and facilitate e-government implementation across the whole of Saudi government agencies. In order to implement the national e-government strategy, the Government adopted a decentralized form of coordinated governance to encourage and empower collaboration and coordination among various government agencies which provide related public services and are part of government information value chains. The Yesser also articulates e-government implementation action plans, e-government priorities, policies and governance frameworks, standards for the specifications of e-government systems, and practical guidelines for government agencies to implement their own e-government portals and business projects such as business process re-engineering and process chains integration (Yesser 2012a).

Yesser identifies its e-government implementation action plans in two phases: Saudi Arabia's first five-year plan (2006 to 2010) and Saudi Arabia's second five-year plan (2011 to 2015).

### 2.4.7 Saudi's first national e-government strategy and action plan

#### 2.4.7.1 Vision

Saudi Arabia's first five-year plan (2006 to 2010), which was completed to improve the productivity and efficiency of public-sector service performance, provided better public services for citizens and businesses, increased returns on investment, and provided government information to stakeholders in a timely and accurate manner. A key output of the first phase is the implementation of the Saudi E-government National Portal 'Saudi', a one-stop, integrated public services portal which links visitors to various portals and websites of Saudi government agencies.

Based on Yesser (2006), Saudi's first e-government strategic plan stated that users should, in principle, be able to access government services independently from where they happen to live or work (cities or countryside), from inside and outside the country, and practically at any time convenient to them. Also, the needs and wishes of the users as to how a government service is to be administered should also guide the initiative with respect to improving or e-enabling the services, i.e., in transforming the services from traditional ones to e-services. In short, e-government and e-services should be user-centred and driven by user demand. The e-services themselves should be provided to the users in a seamless and integrated way, which, for example, should not involve the need to contact several government agencies to access one single service. On the contrary, all requirements for obtaining a service should be transparently integrated and administered through one point of contact and the same data should be provided by the user only once. The user should also be able to access government e-services through a broad variety of electronic means, such as internet, kiosks, and mobile phones (SMS); and in all such electronic interactions with the user, government agencies administering services should maintain the highest possible standard of security. Finally, the Strategy and Action Plan was intended to be implemented before the end of 2010. This five-year horizon aimed at boosting motivation, to achieve the goals defined, and to ensure timely delivery of the identified projects. Figure 2.4 depicts this vision.

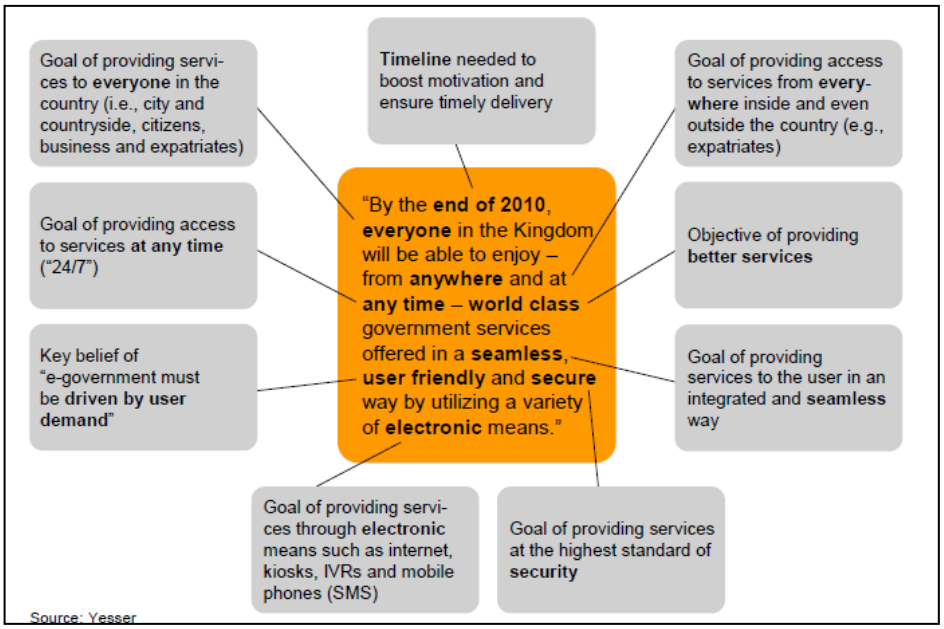


Figure 2.4 Vision statement for Saudi-Arabia's e-government initiative

2.4.7.2 Objectives

The vision for Saudi's e-government initiative, described in the previous subsection, is further detailed by 10 objectives which were to be achieved by the implementation of the initiative. According to Yesser (2006) these objectives are divided into three groups:

1- **Providing better services by the end of 2010:** This first group of objectives is directly related to the vision of providing better government services to citizens, expatriates, businesses and government agencies. The objectives of this group are to present the most important 150 services electronically and to deliver these services in a seamless and user-friendly way at the highest standards of security. These services should be available to everyone in Saudi Arabia 24/7 and accessible from anywhere. A 75% adoption rate with respect to the number of users with an 80% user satisfaction rating was sought.

2- **Increasing internal efficiency and effectiveness:** This second group of objectives is indirectly related to the vision of providing better services by specifying objectives which, if achieved, would strongly raise government efficiency and effectiveness in general. By improving the back-office performance of agencies administering services, the agencies themselves would greatly increase productivity and be in a better position to provide world-class services to the users. The objectives of this group are to deliver all possible official intra-governmental

communication in a paperless way. This would ensure accessibility of all required information across government agencies and include storage of information with low redundancy. Goods and services above a reasonable value threshold would be purchased through e-procurement.

3- **Contributing to the country's prosperity**: This third group of objectives is related to a broader goal of the e-government initiative, namely to contribute to the country's prosperity overall. The objectives of this group contributed to the establishment of the information society in the Kingdom by spreading information, knowledge and the use of e-services. These helped to improve the use of the country's assets and resources by increasing society's productivity in the private, business and public sectors.

### 2.4.8 Saudi's second national e-government strategy and action plan

#### 2.4.8.1 Vision

Saudi Arabia's second five-year plan (2011 to 2015,) which is currently operational, was designed to enhance transparency of public services and citizen empowerment by increasing citizens' awareness of government-owned data (based on Saudi open data policies) and various e-government services. The vision for e-government in Saudi Arabia is: "Enabling everyone to use effective government services, in a secure integrated and easy way, through multiple electronic channels" (Yesser 2012b, p. 18). In order to successfully implement the second national e-government strategy and action plan, this national vision must be used by each government agency to develop an individual e-government vision and strategic action plan for agencies and sectors. Creating a consistent and coherent approach across the wide range of individuals employed to deliver the government strategy, from government agencies and from suppliers in the ICT industry, can be assisted by the formal adoption and usage of a set of values for the e-government program, which are then, included in individual agency vision and strategic action plan.

#### 2.4.8.2 Objectives

Internationally, governments have recognized that the pace of change in politics, economics, society and technology create the need for flexible and dynamic plans that are able to respond to these changes. The second action plan has an initial focus on initiatives

that will build momentum over the first two years and create a foundation for further projects in the following three years and beyond (Yesser 2012b).

Funding of the projects scheduled for these first two years can be met within the already approved e-government budget. A major review before the end of the second year of the plan will determine how effective the identified initiatives have been in building the capability of increasing the pace of delivery of e-government. This major review would also use the experience of the first phase of the program, together with the improved information from the Ministry of Finance on IT expenditure, to make recommendations on the extent of additional funding for the program (Yesser 2012b). According to Yesser (2012b), the Saudi's second national e-government strategy and action plan objectives are:

- The development of Government-wide Communications, Collaboration, Leadership and Culture Change programs to support e-Government.
- Increased awareness about available e-services for the maximum proportion of the population.
- The requirement for each agency to publish a roadmap of their proposed e-services, and then implementation of the e-services to increase number and maturity of e-services nationally.
- The establishment of a central pool of ICT resources as a response to resource shortages, an increase in the employment of women, strengthened e-government Learning and Capacity Building, and improved agency communications.
- Continued implementation of the three National Applications identified in the first action plan (National Statistics Databank, e-correspondence and e-procurement), together with a standardized approach to National Shared Applications
- Strengthened operational excellence of the national shared infrastructure for e-government, which is operated by Yesser.
- Increased usage by government agencies of the Government Service Bus, through deployment of teams to fast-track the connection of individual agencies.
- The implementation of the use of an SMS messaging gateway by agencies.
- The implementation of a Cloud Computing delivery model.

- Piloting the use of web based media and social media for the evaluation of provided e-services.
- Increased use of public Private Partnerships and framework agreements by agencies
- Enhanced governance of the e-government program “Yesser”.
- Review and revision of the funding process.

## 2.5 Saudi E-Government from demand-side perspective

### 2.5.1 Ministry of Higher Education

The Ministry of Higher Education was established in 1975, taking the responsibility for determining the policies and directions of university education in Saudi Arabia. University education has received generous financial and political support that helps to establish new universities, colleges of science and other educational institutions. There are now twenty one government universities, six private universities and eighteen private colleges. The Ministry of Higher Education has seven deputies and departments as following:

- Deputy for Planning and Information Affairs, with the general objective of implementing the objectives and the policies of the ministry in planning, information and technology.
- Ministry Deputy for Educational Affairs, with the general objective of executing the mission and to apply policies of the Ministry in the various fields of education.
- Ministry Deputy for Scholarship Affairs, with the general objective of general supervision of ministry scholarships, planning, policy making and regulation of scholarships.
- General Department of Media & Public Relations, with the general objective of communication with the public, the media, and building a positive image of the ministry.
- General Department of Administrative and Financial Affairs, with the general objective of providing all administrative and financial services for the various administrative units in the ministry.

- General Department for Culture Missions, with the general objective of supervision of all works of the culture missions abroad, and follow-up of staff seconded to work at missions and local contracted staff at each country.
- General Department for International Cooperation, with the general objective of Assurance of effective co-ordination with government and private universities, agencies outside the kingdom concerned with higher education and academic research, and the regional and international agencies and organizations.

### 2.5.2 Ministry of Higher Education e-services

Under the Yesser e-government strategic initiative, the Ministry of Higher Education is to start facilitating e-government services to all its stakeholders, including academic institutions, cultural missions, students who are enrolled in the domestic universities mentioned earlier and students studying overseas. Many of the e-government services have integrated transactional e-services, which are accessible via the Ministry of Higher Education Portal for easy access by the wide range of stakeholders. Figure 2.5 shows the integrated e-government services at the Ministry of Higher Education Portal.

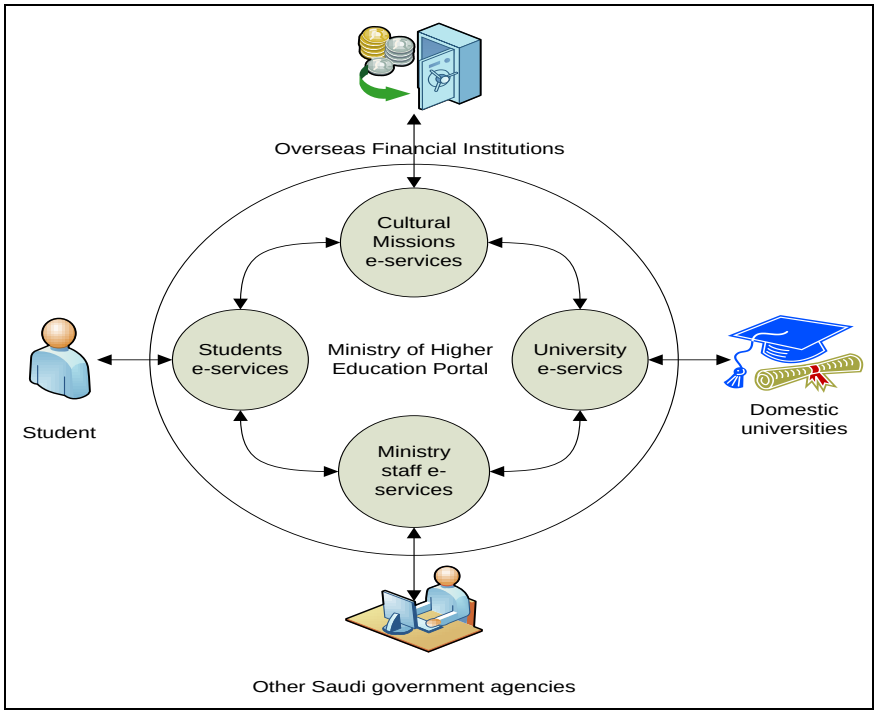


Figure 2.5 Integrated e-government services at the Ministry of Higher Education Portal

According to the Ministry of Higher Education (2013), the Ministry's Portal provides informational and transactional e-services for four types of student stakeholders. The first type is students studying abroad who can access up to ten different e-services. The second type is students who want to join the King Abdullah Foreign Scholarship Program, an initiative begun in 2005 by King Abdullah, to support Saudi universities and to supply the public and private sectors in the Kingdom with highly qualified Saudi citizens, for increased international competitiveness in the labour market and the various fields of scientific research. To date the Program continues to support approximately 106,000 Saudi students who pursue their undergraduate and postgraduate university education abroad in 22 countries. The third type of student is the local scholarship holders. The fourth type of student is the students who are studying overseas. Those students can be from King Abdullah Foreign Scholarship Program, from any Saudi university, any Saudi institute or from any Saudi ministry. The Ministry of Higher Education provides those various types of Saudi students with a total of 38 e-services through a special website for them called 'Scholarship Students Portal'. This portal provides access to e-services for all Saudi students studying overseas.

In addition to the students, the Ministry of Higher Education Portal is accessed by the local Saudi universities and educational institutions. The Ministry of Higher Education provides its e-services to Saudi universities and educational institutes through two e-government systems: the Private University Licensing system and the Seminar and Conference System. Moreover, the Ministry of Higher Education Portal is accessed by the Saudi Arabian Cultural Missions (SACM) located overseas. They are also known as the Cultural Missions of the Royal Embassy of Saudi Arabia. SACMs are quasi-government organisations established by the Ministry of Higher Education to manage Saudi students' pathways from start to finish during their course of study abroad (SACM 2012). The Ministry of Higher Education Portal will provide SACMs with 97 e-services to all SACMs worldwide.

Finally, the Ministry of Higher Education Portal provides the Ministry staff with e-services. The ministry staff e-services consist of 36 e-services provided through two e-government systems. Figure 2.6 shows the Ministry of Higher Education e-services. First, 'Scholarship Annexation, Upgrade and Follow-up System' with 26 e-services facilitates

the Ministry staff to initiate, extend, or terminate a student's scholarship, as well as approving students' academic trips, such as conference travel and scientific field trips. Second, the 'Staff Portal' is an informational and functional web portal, dedicated for employees who work from home with 10 e-services for tracking salary information, registering training courses, and monitoring internal promotions.

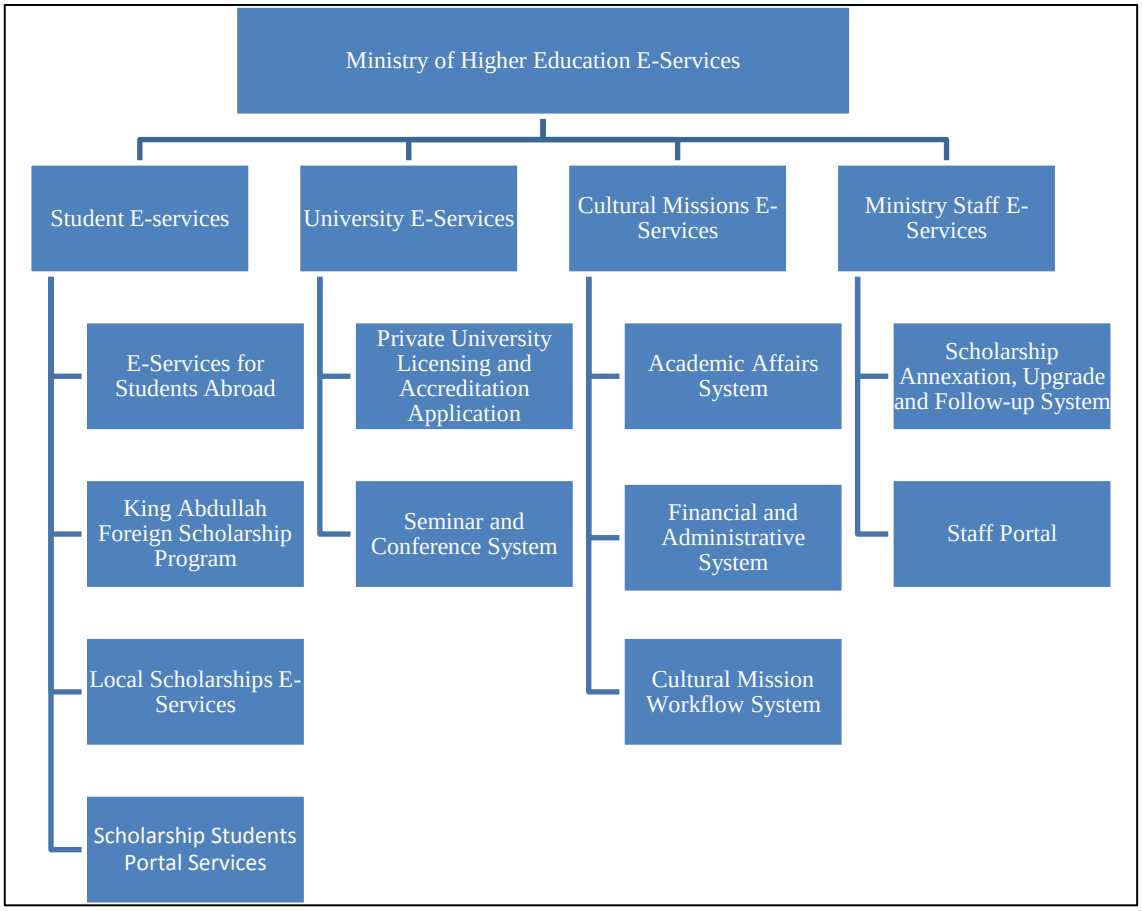


Figure 2.6 Ministry of Higher Education e-services

### 2.5.3 Financial transaction e-services

The Ministry of Higher Education Portal currently provides eleven different transactional e-services for Saudi students studying abroad. All financial services go through the standardized workflow (Figure 2.7): the request submission, the check for the required information and documents, investigating eligibility and the actual payment from the Finance department in SACM. Financial transactional e-services are accessed through the SACM portal. For example, the e-service "Academic conferences request" shares information contained in a financial transaction among the student, SACM, and the

travelling agent, when the student applies for conference travel outside the university. This transactional service is very simple for the student to apply, but it has a complex workflow. This is because multiple government agencies are involved in the decision-making process for approval. After the student's application, SACM needs to evaluate the application and to send its decision to the Ministry of Higher Education (Educational Affairs Agency) for its final approval. When the Ministry of Higher Education evaluates the application, the Ministry's decision is returned to SACM. If the application is accepted, money is transferred to the student's bank account in the amount of the conference cost, and money is paid to the travelling agent for the airline ticket and hotel accommodation.

The Ministry of Higher Education Portal for Saudi students studying abroad provides 11 financial services, all transactional services. The following are examples of these services:

**Service Name:** Ticket booking order
**Financial transaction from:** Saudi Arabia Cultural Mission (SACM).
**Financial transaction to:** The travel agent.
**Description:** The student can make a ticket booking order and also add information about flight date and time. This service includes a third party, which is the travelling agent. The financial information will be transferred to the travelling agent, and the student will be notified when the money has been transferred. So, the student will only fill in the trip information and the SACM will pay the travelling agent. SACM will pay the travelling cost of all the student's dependants.

**Service Name:** Academic conferences request
**Financial transaction from:** Saudi Arabia Cultural Mission.
**Financial transaction to:** The student and the travelling agent.
**Description:** Through this service the student can apply to attend conferences, seminars or workshops outside the student's study city. The conference or seminar or workshop should be in the same area as the student's major. This service does not include undergraduates. This service is very simple to apply, but has a complex workflow. This is because multiple government agencies share the approval decision. After the student applies for this service, SACM will study the request, then send it to the Ministry of Higher Education (Educational Affairs Agency), to consider the approval. When the Ministry of Higher

Education finishes its investigation, the request will go back to SACM with either approval or rejection. If the request is accepted, the cost of the conference attendance will be transferred to the student's bank account, and the cost of the flight ticket will be transferred to the travelling agent.

**Service Name:** Request a scientific trip
**Financial transaction from:** Saudi Arabia Cultural Mission.
Financial transaction to: The student
Description: The system user can apply to have a scientific trip. The scientific trip is allowed only for graduate students (master's or doctorate) to make a scientific trip, either within the Kingdom of Saudi Arabia or to other countries, should they need to collect data and conduct research. If the scientific trip is within the Kingdom, the student is paid by a monthly salary for each month spent on the trip, not to exceed a maximum duration of three months. The attraction of this service is its outside simplicity, but it has an inside complexity. In other words, applying to this service is a very easy job for the student, but it hides a complex workflow. The complexity is because this service could include many ministries and government agencies. For example, when a student submits the online application, the SACM will study the request, then send it to the Ministry of Higher Education to investigate the request. Next, the request will be sent to the student's employer to investigate the benefit of this trip to the workplace. Finally, the request will go back in the same workflow to SACM, with the final decision of acceptance of rejection. Thus, this service has a complex workflow, but it is hidden under a simple online application.

All the previous financial services go through the same workflow (Figure 2.7). These workflows go through several stages. These stages are the request submission, the check for the required information and documents, investigating eligibility and the actual payment from the Finance department in SACM.

The financial transactional services are always in a one way path. In other words, the financial transfer always starts with SACM and goes to the other beneficiaries. In the opposite case, when money needs to be transferred to SACM, a direct debit to the SACM bank account is required with a reference number. The person who transfers the money

should contact SACM through e-mailing the employee in charge with the reason for this transfer and the transfer reference number. The Saudi E-government National Portal "Saudi" plays an important role in improving government agency transparency. In fact, it radically changes the old way of doing business with government. Before the introduction of National Saudi Portal "Saudi", the Saudi e-government program Yesser was pushing the government agencies to e-service, although many of them had no real workflow maps or even detailed procedural information about how the work should be done. In addition, some government agencies do not even have a website or any electronic means to be accessed. The work is usually done based on general guidelines and the personal evaluation of the government employees, which depends also on the employee's expertise of work, which may result, for example, with two beneficiaries with the same issue or request following different procedures. Doing business with government agencies usually requires the physical presence of the beneficiary and asking the information desk about the procedure and the required documents. So, in most cases the service beneficiary takes all the possible documents that might be required, going to the government agency with no idea about the procedure that he/she should follow.

In the case of the Ministry of Higher Education MOHE, and before the introduction of the Ministry of Higher Education portal, there was no clear information about the ministry's services and no information about the procedures of doing business with the ministry. The Ministry of Higher Education serves Saudi students who want to study abroad or are currently studying abroad, who attend local Saudi universities, or attend Saudi Cultural Missions worldwide. It is obvious that most of its services will be provided to people outside Saudi Arabia. However, before the introduction of the MOHE portal, paper work was the only way to process a request, including the cost of sending the paperwork by international couriers and the cost of calling the ministry to follow up the request. In addition, the time to finish any request can depend on the number of other agencies that could be involved in making the decision for that request. Moreover, because of the lack of information about the ministries' services, it is very likely that the wrong paperwork will be sent and an important decision could take months.

Since the introduction of the MOHE portal, the situation has been radically transformed and the Ministry of Higher Education has become more transparent. The MOHE portal

provides the structure of the whole ministry and detailed information about every department of the ministry, their roles and objectives. In addition, every department provides information about all the services it provides. Most of the departments provide email addresses of the department officials, including phone numbers. However, the only one who has electronic form is the minister himself, while all ministries' officials can be contacted electronically via emails. The MOHE portal provides manuals for all the services, despite them not having been updated regularly. These manuals have a full description of the e-services and every single step required to use them, and the required documents for each service. After the MOHE portal, citizens should become more aware about the ministry and its services. Citizen should know about every step for their request and the department responsible for it. The MOHE provides its e-services through the MOHE portal and through the Saudi E-government National Portal 'Saudi' with links to each service inside the MOHE portal. The MOHE portal publishes all the ministry events and news that may concern the citizens, allowing them to comment on the event though electronic means. In summary, the Ministry of Higher Education has radically improved its transparency by improving the general public awareness of its roles and services.

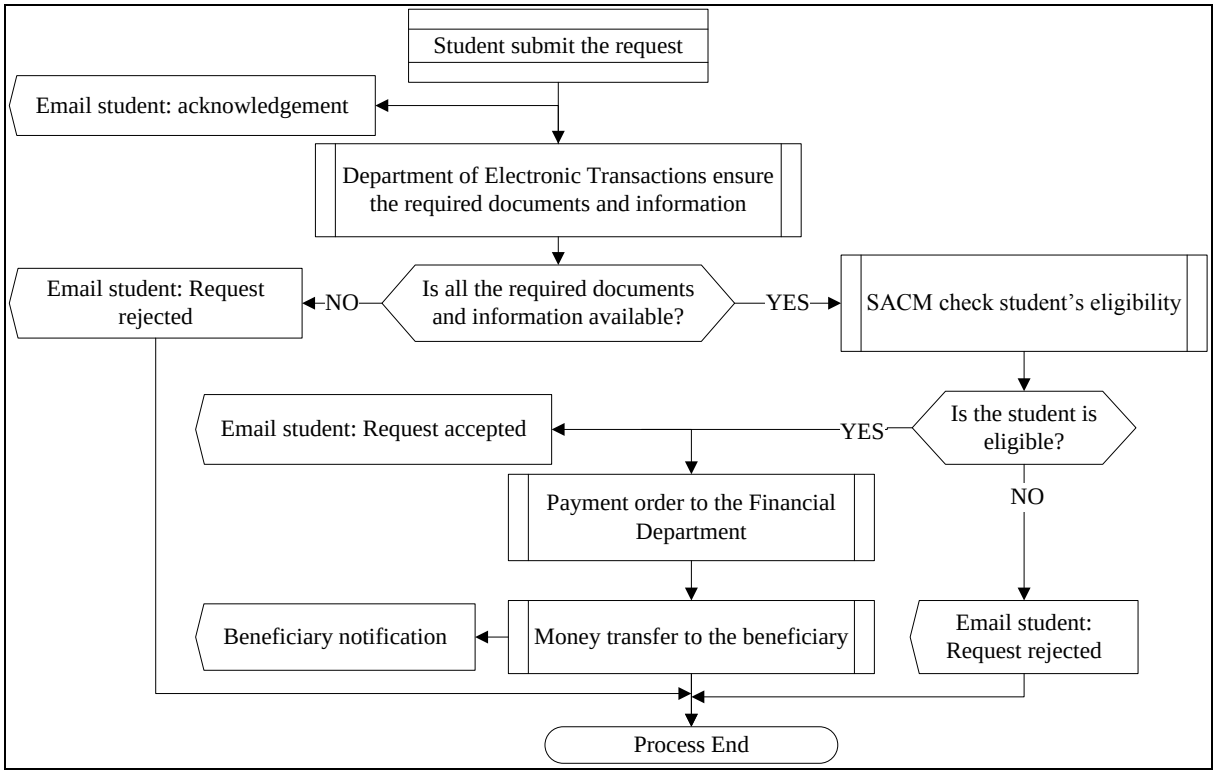


Figure 2.7 Financial services workflow Source: the services description at SACM

As the Saudi government is concerned with providing government services online, the Ministry has started to facilitate electronic services to all its beneficiaries, including academic institutions, cultural missions and students. ( Electronic services, or e-services, are the transactional services as defined in the literature review section of this thesis). These e-services were launched via the Ministry of Higher Education Portal for easy access to the beneficiaries.


Figure 2.8The Ministry of Higher Education Portal

According to The Ministry of Higher Education (2013) website, this portal provides e-services (transactional services) for four types of beneficiaries. First, the portal is providing 47 e-services (transactional services) for the students, to fulfil their needs. It also provides

21 forms services (non transactional services). Second, it provides five e-services for universities, in order to facilitate procedures and a close association with educational institutions to serve the beneficiaries. Third, the portal provides 97 e-services to the cultural missions worldwide. The Saudi Arabian Cultural Mission (SACM), also known as the Cultural Mission of the Royal Embassy of Saudi Arabia, is the organisation established by the Ministry of Higher Education.

## 2.6 Summary

This chapter started by presenting the main areas of Saudi Arabia: location, population, and economy. It gave an overview of the current state of ICT in Saudi Arabia. Then it showed a comprehensive view of all the Saudi e-government initiatives. Finally, this chapter presented the e-services that are provided by the Saudi Ministry of Higher Education portal as the research context. The next chapter will give a comprehensive review of the relevant research literature.

# CHAPTER 3: LITERATURE REVIEW

## 3.1 Introduction

This chapter aims to review the existing literature to develop a better understanding of the concept of continuance (or continuous use) of e-government services and to identify the critical antecedents that may influence citizen continuance. In section 2, the definitions and concepts of e-government will be presented. In section 3, the literature on e-government use will be reviewed. Then in section 4, the emerging conceptions of IS continuance in the IS field will be analysed and discussed. In section 5, the demand-side antecedents of e-government continuance will be described, namely: habit, intention to use, emotion, social media use, frequency of past behaviour, satisfaction, expectation conformation, trust in e-government, and computer self-efficacy. Next, in section 6, the supply-side antecedents of e-government service provision will be discussed, namely: service comprehensiveness and service quality. Finally, section 7 will present a new research model for e-government continuance, which is the central focus of my thesis.

## 3.2 E-government definitions & concepts

### 3.2.1 Definitions

Within the last decade, the term e-government has been used as much in political speech as in journalistic work and, more recently, has appeared in academic research literatures (Gil-Garcia 2012). However, there is no general consensus with respect to what e-government is and what its main characteristics are (Hardy & Williams 2011). In consequence, Gil-Garcia (2012, p. 2) even asserts: "There is no clear consensus about what electronic government means."

In this section, different definitions of e-government that exist in the literature are identified and classified into two categories. The first category of definitions tends to focus on the use of information and communication technologies (ICTs) in government (Brown & Thompson 2011). The second category tends to focus on the improvement or transformation of e-government. It also tends to focus on the potential benefits of e-

government such as transformational government (Hu *et al.* 2012). Table 3.1 shows prime examples of the existing various definitions of e-government.

As the Table shows, the first category of definitions primarily emphasize the use of ICT to make government information more accessible to citizens. For example, Reddick (2009, p. 2) defines e-government as "the public sector's use of information and communication technologies (ICT) to deliver information and services to citizens through the Internet or other digital means, 24 hours a day, seven days a week." Another example of the first category is found in Gil-Garcia (2012, p. 1), who has reviewed various e-government definitions and concludes that: "New technologies are continuously emerging and expanding its object of study, but the overall phenomenon is still the same. Following this perspective, e-government is or should be a broad concept that includes socio-technical aspects of the selection, design, implementation, and use of any kind of information and communication technology in government, from fax machines and mainframe computers to complex websites, Web 2.0 tools, social media, and open government applications." Gil-Garcia (2012) identifies four basic elements or dimensions of e-government: (a) the use of ICTs (computer networks, internet, telephones, and faxes), (b) the support of governmental actions (to provide information, services, administration, products), (c) the improvement of government relationships with citizens (through the creation of new communication channels or the promotion of citizen engagement in the political or administrative process), and (d) the use of a strategy to add value to the participants in the process" (Gil-Garcia 2012, pp. 8-9).

Another example of the category 1 definition of e-government is provided by Jaeger (2003, p. 1) as "technology, particularly the Internet, to enhance the access to and delivery of government information and services to citizens, businesses, government employees, and other agencies". This definition also determines the type of ICTs to be used as a medium for e-government, which is the Internet. It also specifies the role of the Internet to enhance the access to and delivery of government information and services. This definition also recognises the use of e-government to enhance the relation between government and citizen (G to C), government to businesses (G to B) and government to government employees. Finally, Criado & Ramilo (2003, p. 193) define e-government as "the different ways in which governments and public managers contact and interact with their citizens

through their Web sites, but also other Internet uses (e-mail or IRC), and different tools, like video conferencing, touch-tone data entry, CD-ROM, private intranets, or satellites and antennas". This definition includes the term 'interact' to underscore relationships between governments and citizens.

In contrast to the category 1 definitions of e-government, a prime example of the second category is found in the definition by the World Bank (2011). E-government is defined as *"the use* by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to *transform* relations with citizens, businesses, and other arms of government". This definition emphasizes the government's ability to transform relationships with its salient stakeholders. Similarly, the second category of e-government definitions in the research literature also emphasize the importance of improving or transforming various dimensions of e-government. A prime example of this second category is the definition by Scholl (2007, p. 23; 2010, p. 3) as *"the use* of information and technology to *support and improve* public policies and government operations, engage citizens, and provide comprehensive and timely government services". It is clear that this definition focuses on aims and goals of e-government beyond the mere use of ICT in government. It emphasizes the potential benefits of using ICT in government which would encompass the core business of government: public policy making, public services, and citizen engagement.

While earlier definitions of e-government tended to belong to the category 1, there are some notable exceptions. Heeks (2003, p. 2) sees e-government as "the use of information and communication technologies (ICTs) to *improve* the activities of public sector organisations – brings with it the promise of *greater* efficiency and effectiveness of public sector operations". This definition includes the efficiency and effectiveness as consequences of using ICT by public sector organisations' 'e-government'.

In summary, Table 3.1 lists a limited but representative sample of existing e-government definitions in the e-government literature. The first column shows the category (developed in this research), definition, and references.

Table 3.1 Extant various definitions of e-government

| Category | Definition | References |
|---|---|---|
| 1 | "e-government is one of many terms used to represent and describe a complex socio-technical phenomenon that has been studied for several decades. New technologies are continuously emerging and expand its object of study, but the overall phenomenon is still the same. Following this perspective, e-government is or should be a broad concept that includes socio-technical aspects of the selection, design, implementation, and use of any kind of information and communication technology in government, from fax machines and mainframe computers to complex websites, Web 2.0 tools, social media, and open government applications" | Gil-Garcia (2012, p. 1) |
| 1 | "E-government provides the convenience and availability of government services and information to public." | Sharma et al.(2012) |
| 2 | "the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government." | The World Bank (2011) |
| 2 | "the use of information and technology to support and improve public policies and government operations, engage citizens, and provide comprehensive and timely government services" | Scholl (2007, p. 23; 2010, p. 3) |
| 1 | "the public sector's use of information and communication technologies (ICT) to deliver information and services to citizens through the Internet or other digital means, 24 hours a day, seven days a week." | Reddick (2009) |
| 1 | "the use of information and communication technologies in government settings" | Gil-Garcia & Martinez-Moyano (2007, p. 266) |
| 1 | "the communication between the government and its citizens via computers and a Web-enabled presence." | Evans & Yen (2006, p. 209) |

| | | |
|---|---|---|
| 2 | "the use of ICT tools to reinvent the public sector by transforming its internal and external way of doing things and its interrelationships with customers and the business community" | Ndou (2004, p. 3) |
| 1 | "the different ways in which governments and public managers contact and interact with their citizens through their Web sites, but also other Internet uses (e-mail or IRC), and different tools, like video conferencing, touch-tone data entry, CD-ROM, private intranets, or satellites and antennas" | Criado & Ramilo (2003, p. 193) |
| 2 | "technology, particularly the Internet, to enhance the access to and delivery of government information and services to citizens, businesses, government employees, and other agencies." | Jaeger (2003, p. 1) |
| 2 | "the use of information and communication technologies (ICTs) to improve the activities of public sector organisations – brings with it the promise of greater efficiency and effectiveness of public sector operations." | Heeks (2003, p. 2) |
| 2 | "a way for governments to use the most innovative information and communication technologies, particularly web-based Internet applications, to provide citizens and businesses with more convenient access to government information and services, to improve the quality of the services and to provide greater opportunities to participate in democratic institutions and processes" | Fang (2002, p. 1) |
| 1 | "government's use of technology, particularly web-based Internet applications to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities." | Layne and Lee (2001, p. 123) |

### 3.2.2 Types of e-government services

#### 3.2.2.1 E-government supply-side and demand-side perspectives

In his analysis of the evolution of e-government adoption studies, Reddick (2005) identifies two emergent e-government perspectives: the supply side and the demand side. On the one hand, the supply side perspective is a government-centric view of public services policy, provision, and delivery. More specifically, this perspective views government as the supplier of public services and rather exclusively focuses on public service offerings, usually without engagement and consultation with the users, including citizens. On the other hand, the demand side perspective is a user-centric view of public services, and therefore, it aims to understand the demands of the users of e-government, and to identify how citizens engage and interact with e-government (Reddick 2005).

Much of the existing studies on e-government adoption and use have explored it from a supply-side perspective. In his surveys of what governments offer online, Reddick (2005, p. 42) has documented evidence and concluded that "the demand side perspective has been relatively unexplored".

#### 3.2.2.2 Government- to-citizen (G2C)

Government-to-citizen describes those between government and individual citizens (DeBenedictis *et al.* 2002). G2C initiatives are designed to facilitate citizen interaction with government, which is what some observers perceive to be the primary goal of e-government (Sandoval-Almazan & Gil-Garcia 2012). These initiatives attempt to make transactions, such as renewing licenses and certifications, paying taxes, and applying for benefits, less time consuming and easier to carry out (Seifert & Petersen 2002). The citizen demand for G2C is expected to increase significantly over the next ten years as the youth, who are now growing up in the information age with personal computers and the Internet as routine presences in their lives, become adults (Seifert 2008). The majority of government services are directed with this in mind, providing citizens and others with comprehensive electronic resources to respond to individuals' government transactions. The ultimate aim of this

application is to give users different options and communication channels for government transactions. In this doctoral research, the focus will be only on G2C.

#### 3.2.2.3 Government-to-business (G2B)

Government-to-Business covers exchanges between government and commercial and non-profit enterprises (DeBenedictis *et al.* 2002). G2B initiatives received a significant amount of attention as a result of the high enthusiasm of the business sector, and the potential for reducing costs through improved procurement practices and increased competition (Gilbert 2001). The G2B sector includes both the sale of surplus government goods to the public, as well as the procurement of goods and services (Seifert 2003). E-Procurement is the main application of G2B e-Government, that allows government agencies to reap the benefits being realized in the private sector though electronic means (Fang 2002). According to Seifert (2003), there are two primary forces driving the G2B sector. The first is the business community which uses electronic means to carry out various activities such as procurement, sales, and hiring. The second primary force motivating interest in the G2B sector is the growing demand by policymakers for cost cutting and more efficient procurement.

#### 3.2.2.4 Government-to-government (G2G)

Government-to-Government includes interactions within or between governments (DeBenedictis *et al.* 2002). The main aim of G2G is to facilitate processes between inter-governmental organisations by streamlining collaboration and coordination (Alsaghier *et al.* 2009). The G2G sector represents the backbone of e-government, because it involves sharing data and conducting electronic transactions between governmental agencies (Seifert 2008). In G2G, a lot of government processes and transactions involve collaboration and inputs from different public organisations. For example, some requests that seem to be simple need many government agencies to collaborate and share some information to finish the request. The ultimate aim of the G2G application is to enhance inter-governmental organisations' processes by streamlining collaboration and co-ordination (Huang *et al.* 2005). Examples of G2G e-government include E-Identity, E-Security services, Electronic Document Management, and Process Management Services (Alsaghier *et al.* 2009).

#### 3.2.2.5 Government-to-employee (G2E)

Government to-employee initiatives " facilitate the management of the civil service and internal communication with governmental employees in order to make e-career applications and processing systems paperless in the E-office"(Fang 2002). G2E focus on the online relationships between government agencies and their employees, who face the same requirements as that of the relationships between businesses and their employees (Belanger & Hiller 2006). Governments are just as interested as private-sector organizations in providing electronic services and information to their employees. Because employees of federal and state governments often work in a variety of geographic locations, government – to – employee (G2E) applications may be especially useful in enabling efficient communication and collaboration (Turban & King 2012). A good example of G2E is the intranet used to provide information to employees, or online transactions which employees can perform if agencies have the proper technological architectures (Belanger & Hiller 2006).

### 3.2.3 Levels of e-government services

The development of e-government often is characterized as enterprise-wide, complex projects involving many government agencies for multiple years. Extant e-government stage models suggest that the process of e-government development progresses through different stages of increasing sophistication and functionality Irani *et al.* (2007a). These stage models argue that e-government development projects tend to progress through the common stages, despite the fact that different e-government projects have different goals and expectations.

A United Nations (2012) Report identified four widely known e-government development stages: emerging information services, enhanced information services, transactional services and Connected services.

In the first stage, *Emerging information services*, government websites provide information on public policy, governance, laws, regulations, relevant documentation and types of government services provided. They have links to ministries, departments and other branches of government. Citizens are easily able to obtain information on what is new in the national government and ministries and can follow

links to archived information. At the second stage, *Enhanced information services*, government websites deliver enhanced one-way or simple two-way e-communication between government and citizen, such as downloadable forms for government services and applications. The sites have audio and video capabilities and are multi-lingual. In the third stage, *Transactional services*, government websites engage in two-way communication and interaction with their citizens, including requesting and receiving inputs on government policies, programmes, regulations, etc. Some form of electronic authentication of the citizen's identity is required to successfully complete the exchange. Government websites process non-financial transactions, e.g. e-voting, downloading and uploading forms, filing taxes online or applying for certificates, licenses and permits. They also handle financial transactions, i.e. where money is transferred on a secure network to government. Finally, at the fourth stage, *Connected services*, government websites aim to change the way governments communicate and interact with their citizens. They are proactive in requesting information and opinions from the citizens using Web 2.0 and other interactive tools. E-services and e-solutions cut across the departments and ministries in a seamless manner. Information, data and knowledge are transferred from government agencies through integrated applications. Table 3.2 shows different e-government development stages.

Table 3.2 Different stages of e-government development

| Stage 1 **(Lowest)** | Stage 2 | Stage 3 | Stage 4 **(Highest)** | Reference |
|---|---|---|---|---|
| Emerging | Enhanced | **Transaction** | Connected services | United Nations (2012) |
| Information publishing | Two way communicating | **Transaction** | Integration | Alsaghier et al.(2009) |
| Web presence | Interactivity | **Transactional** | Transformation | Coursey & Norris (2008) |
| Cataloguing | Transaction | **Vertical integration** | Horizontal integration | Layne & Lee (2001) |

Based on this Report, Figure 3.1 shows how many countries are in each stage.

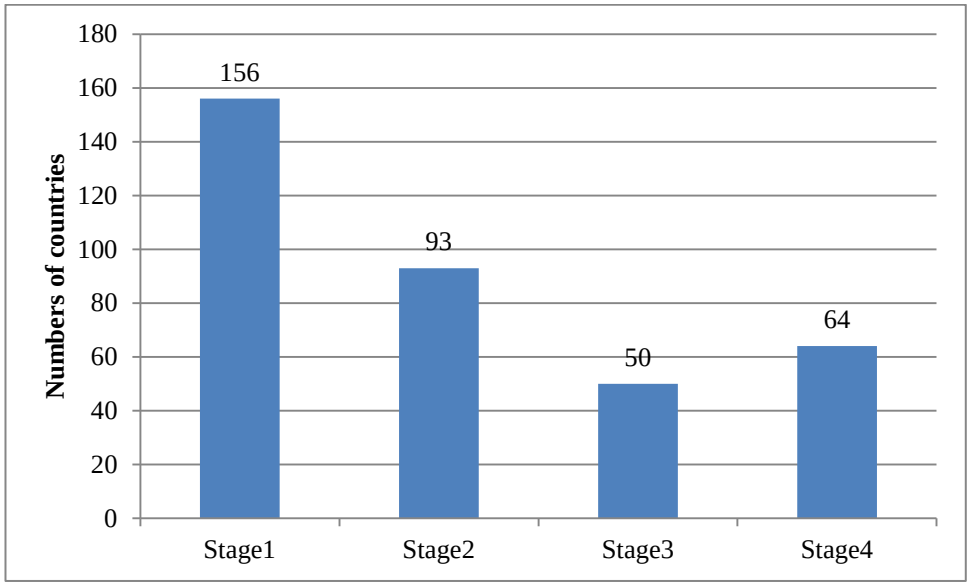


Figure 3.1 Numbers of countries in each e-government development stage (United Nations 2012)

On the other hand, academic researchers have provided different stages. One early stage model by Layne & Lee (2001) shows stages different from the UN stages, which are cataloguing, transaction, vertical integration, and horizontal integration. In addition, authors have many different views. For example, in one stage model, the stages are information publishing, two way communicating, transaction and integration stage (Alsaghier *et al.* 2009), while another author identifies different but similar stages: Web presence, interactivity, transaction and transformation stage (Coursey & Norris 2008). These stages can differ from one model to another.

The first stage, which offers lowest-level e-services and technological functionalities, has different names such Emerging (United Nations 2012), information publishing (Alsaghier *et al.* 2009), and web presence (Coursey & Norris 2008). However, all of these names share the same basic concept. This concept is to make more information accessible to the e-government users (Deakins & Dillon 2002). In this stage, e-government development effort is limited to establishing a basic website about the agency and adding some basic information about it (Koh *et al.* 2008).

The next stage tends to add more capabilities and enhancement. The stage called enhanced (United Nations 2012), two way communicating (Alsaghier *et al.* 2009), or interactivity (Coursey & Norris 2008). In this stage, government websites deliver enhanced one-way or simple two-way e-communication between government and

citizen, such as downloadable forms for government services and applications (United Nations 2012). The government website usually in this stage has audio and video capabilities and are multi-lingual, among other attributes (United Nations 2012). It also gives the user the ability to make online requests, instead of making phone calls or even going to the agency physically. In addition, the use should include being able to download some forms from the agency's website.

The third stage is **transaction** (Coursey & Norris 2008; Alsaghier *et al.* 2009; United Nations 2012). West (2005), who provided the first definition of e-government transactional services, states that e-government stages are only those services in which entire transactions can occur and be fully executed online. For Layne and Lee (2001), transactional services are provided in the second and more advanced stages of their four functional e-government models. E-government initiatives in this stage become more complex and advanced. More capabilities and functions should be added. In this stage, users should be able to obtain services electronically (Coursey & Norris 2008).

The forth and the most advanced stage is called Connected Services (United Nations 2012), or Integration (Alsaghier *et al.* 2009), or Transformation (Coursey & Norris 2008). This is the highest and the most advanced stage of developing the e-government initiatives (Weerakkody & Dhillon 2008). According to the United Nations (2012), government websites have changed the way governments communicate with their citizens. They are proactive in requesting information and opinions from the citizens using Web 2.0 and other interactive tools. Information, data and knowledge are transferred from government agencies through integrated applications. Governments have moved from a government-centric to a citizen-centric approach, where e-services are targeted to citizens through life cycle events and segmented groups to provide tailor-made services. This citizen-centric approach will give the e-government user the ability to communicate and interact with government institutions and across organizations (Zambrano 2008) and this will not be achieved unless all the agencies collaborate and streamline their processes (Weerakkody & Dhillon 2008).

## 3.3 E-government use

Since the advent of the Internet, governments have been using a variety of customer service channels with different characteristics used for communication, interaction, transaction and distribution of products and services. Besides the traditional channels, like the front desk and phone, citizens have access to a variety of e-services provided by many government agencies. From a government perspective, increased usage of service delivery through the digital channels is expected to improve efficiency, overall costs and customer service (Teerling & Pieterson 2011). Citizens who use e-government services express higher levels of satisfaction (Reddick 2010). However, there is no comprehensive data available to review the e-government services usage, and data are not yet systematically collected and uniformly available across countries worldwide (United Nations 2012). In addition, there are only a few studies of some developing countries such as Bahrain, Pakistan, Nigeria, Saudi Arabia, Bangladesh and other gulf region countries. (United Nations 2012).

### 3.3.1 Low level of usage

Based on the United Nations E-Government Survey Report (2012), the level of e-government usage still is generally low, even among most advanced e-government countries. E-government low usage limits the reach and impact of e-government services, and more needs to be done if governments are to successfully leverage e-government. The recent financial and economic crisis in particular has shown that e-government projects and realization of their benefits are important for effective crisis response (United Nations 2012). In the European Union (EU) 27 countries, the average usage rate is only 32 percent, and in OECD countries (Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States), the average usage rate in 2010 was only around 40 percent, even after recent increases in citizen take-up of e-services (Wang 2009; United Nations 2012). Figure 3.2 shows comparisons between online sophistication and e-government usage for citizens.

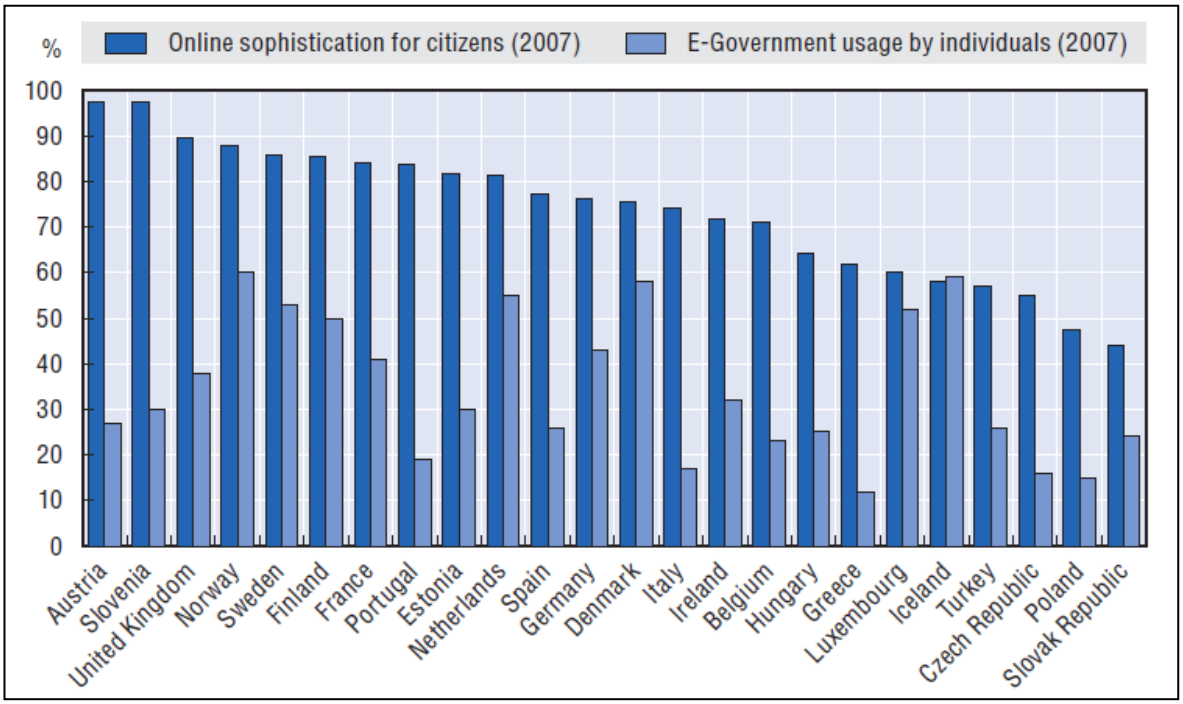


Figure 3.2 Comparisons between online sophistication and e-government usage (OECD 2009)

An example of the low use of e-government is Lithuania (an EU country), where two thirds (66 percent) of the citizens have never used e-government services, despite its Internet penetration rate of almost 70 percent (Pavilenene 2011; United Nations 2012).

So, despite the advantages of using e-government services, "the use of the traditional service channels did not decline after the arrival of the digital channels" (Teerling & Pieterson 2011, p. 171). It also seems as though people add digital channels to their set of service channels, rather than substituting traditional channels with digital channels (Nam & Sayogo 2011; Teerling & Pieterson 2011). In addition, compared to the Internet, telephones in many developed and developing countries are a more popular means of accessing government information (Reddick 2010).

A study conducted in the UK by Hedra, a major consulting firm specialising in government, reported that "Despite nearly two-thirds of Britons having Internet access, fewer than one in three has visited even one of the 3,000 government and council websites and only 5% of Internet users say they regularly use government websites to access public services" (Aichholzer 2004). This study clearly shows that

despite the availability of the services, the number of the service users is very low, which raises the importance of the continuing use of e-government and studying the antecedents of this continuance.

### 3.3.2 Gap between e-government services availability and usage

There is a significant gap between the supply and the use of e-government services in general (OECD 2009). "Government initiatives to implement ICT will not alter the state of digital inequality unless there is continued use" (Hsieh *et al.* 2008, p. 98). Figure 3.2 above shows a significant trend in the figures, suggesting that there is limited correlation between the provision of e-government services and their sophistication. There exists a gap between e-government availability and e-government usage, and this usage has thus far been limited and has not kept up with the fast growing provision and availability of e-services (United Nations 2012). According to recent research by the European Commission, the different speed and growth rate between e-service availability and e-service take-up is substantial (see Figure 3.3 below).

Thus, governments should consider the importance of citizen's awareness of e-government websites and look into the significant factors influencing citizen's intention to continue to use e-government websites (Wangpipatwong *et al.* 2008). Wangpipatwong *et al.* (2009) claimed that initial use of e-government Web sites is an important indicator of e-government success, but it does not necessarily lead to the desired outcome unless a significant number of citizens move beyond the initial adoption and use e-government Web sites on a continual basis.

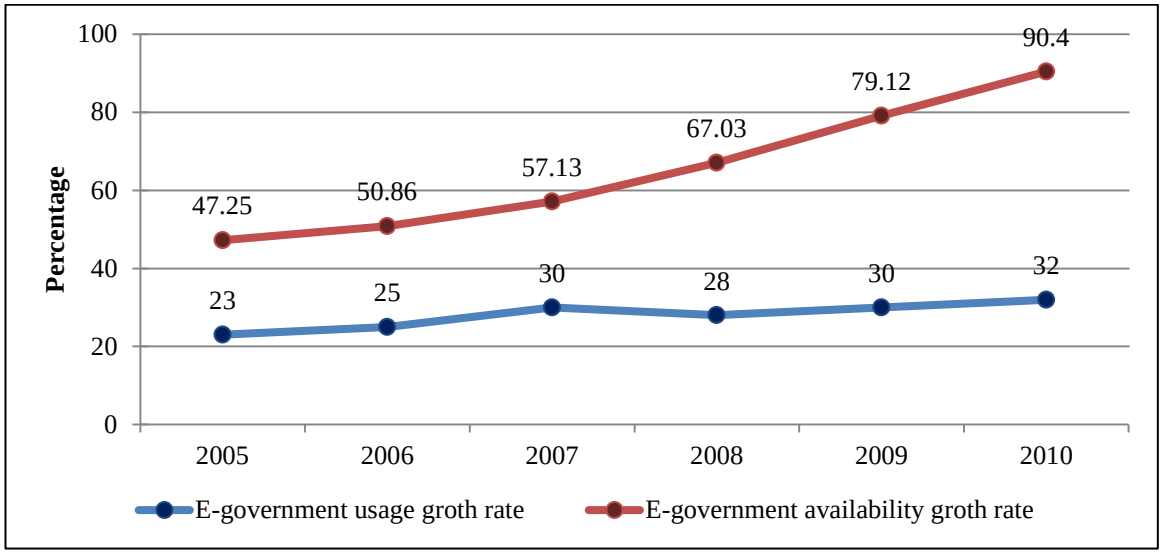


Figure 3.3 E-government usage growth rate lagging behind e-government availability growth rate (United Nations 2012)

Furthermore, prior researches fail to address the key factors influencing continuous use of e-government. A study based on the Technology Acceptance model (TAM) which has added computer self-efficacy as an additional model variable, examined factors influencing the citizen's intention to continue to use e-government websites, and found that perceived usefulness and perceived ease of use had a direct positive impact on enhancing citizen's continuance intention to use e-government websites, whereas computer self-efficacy had no influence on perceived ease of use (Wangpipatwong *et al.* 2008). In addition, prior IS research, based on Expectation Confirmation Theory, which has been widely used to study consumer satisfaction and post-purchase behaviour in marketing research and more recently in IS research, has primarily focused on initial adaption, under the implicit assumption that IS continuance usage can be determined by measuring users' (initial) intention to use only (Bhattacherjee 2001). Research shows that increased expectation of finding government information online seems to influence citizens' continued use (Reddick 2010)

## 3.4 Theoretical background

### 3.4.1 Expectation Confirmation theory

Expectation confirmation theory (ECT) was first articulated by Oliver (1980) in the context of marketing decision-making. It aims to study consumer satisfaction and re-purchase behaviour (Alawneh *et al.* 2013). ECT was developed from cognitive dissonance theory, and was widely used in different product post purchase and service continuance contexts by researchers, to explain consumers' satisfaction and re-purchase intentions (Yang *et al.* 2013).

Oliver (1980) postulates process by which consumers reach repurchase intentions. He identifies five phases. At the first phase, consumers form an initial expectation of a specific product or service prior to purchase. At the second phase, consumers accept and use that product or service. Following a period of initial trial, they form perceptions about its performance (or perceived benefit). So at the third phase, they assess its perceived benefit in comparison with their original expectation and determine the extent to which their expectation is confirmed. At the fourth phase, consumers experience a satisfaction based on their confirmation level and expectation on which that confirmation was based. At the fifth phase, satisfied consumers form a repurchase intention, while dissatisfied users discontinue its subsequent use.

In the IS research field too, IS continuance research has been emerging which draws on the expectation confirmation theory. ECT is a theory which explicitly focuses on a user's psychological motivations that emerge after initial adoption (Limayem *et al.* 2007; Chou *et al.* 2012). ECT is widely used in the consumer behaviour literature to study consumer satisfaction, post-purchase behaviour (e.g., repurchase, complaining), and service marketing in general (Bhattacherjee 2001; Chang & Zhu 2012; Chen *et al.* 2012; Lin *et al.* 2012; Stone & Baker-Eveleth 2013; Terzis *et al.* 2013). The predictive ability of this theory has been demonstrated over a wide range of product re-purchase and service continuance contexts, including restaurant service (Swan & Trawick 1981), automobile repurchase (Oliver 1993), camcorder repurchase (Spreng *et al.* 1996), business professional services (Patterson *et al.*

1997), and institutional repurchase of photographic products (Dabolkar *et al.* 2000). Figure 3.4 shows key constructs and relationships in ECT.

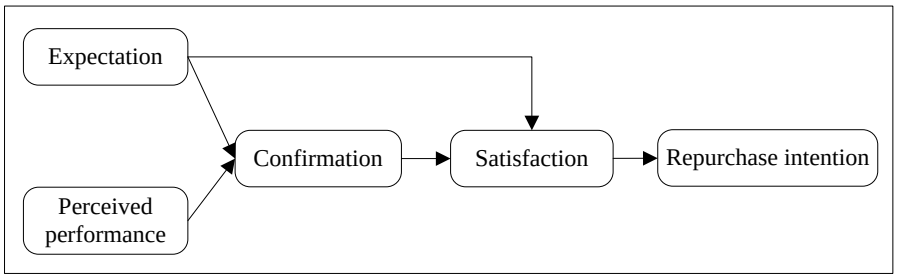


Figure 3.4 Expectation Confirmation theory

ECT posits that user satisfaction is determined by two constructs: expectation of the IS and confirmation of expectation following actual use (Ortiz de Guinea & Markus 2009). Expectation provides the baseline level, against which confirmation is assessed by users to determine their evaluative response or satisfaction (Bhattacherjee 2001). Ortiz de Guinea and Markus (2009) suggest that expectations are formed during, or as a result of, prior experience with IT use.

While expectation refers to a set of pre-exposure beliefs about the product (Venkatesh & Goyal 2010), behavioural expectation is defined as "an individual's self-reported subjective probability of his or her performing a specified behaviour, based on his or her cognitive appraisal of volitional and non-volitional behavioural determinants" (Venkatesh *et al.* 2008, p. 484). A particular strength of behavioural expectation is its ability to capture and account for uncertainty in the prediction of behaviour (Venkatesh *et al.* 2008). The strengths of behavioural expectation are expected to apply to the prediction of system use as well (Venkatesh *et al.* 2008). Behavioural expectation is also able to address the limitation of facilitating conditions, that are tied to an individual's need to have accurate and realistic perceptions of their actual control over the behaviour, by incorporating an individual's tacit sense of control over behavioural enactment in the face of uncertainty (Venkatesh *et al.* 2008). Although e-government research has not used ECT, there is empirical research showing that increased expectation of finding government information online positively influences citizens' actual use (Reddick 2010).

### 3.4.2 Conceptions of IS continuance

Continuance (or continued use) of information systems (IS) is a new topic of increasing interest in the Information Systems literature (Limayem *et al.* 2007; Ortiz de Guinea & Markus 2009; Hsiao & Chiou 2012b; Stein *et al.* 2012; Vandenberghe & Panaccio 2012; Terzis *et al.* 2013). This growing interest in continuing IT use represents a major step forward for the IS community (Ortiz de Guinea & Markus 2009; Sun 2012). There is a new awareness of the importance of the concept of 'continuance' in the IS research field. So, users should go beyond the initial IS adoption stage and use IS on a continual basis. There is a greater need to understand users' continued interaction and participation at a deeper level (Al-Debei *et al.* 2012; Lin 2012). User post-adoption behaviour is important for the success of IS projects (Chang & Zhu 2012; Hsieh *et al.* 2012). In other words, IS adoption is only the first step; the whole system could fail when expected users fail to use the system on a continuous basis (Kim 2009; Hsiao & Chiou 2012a; Hsieh *et al.* 2012). Information systems projects with low continuing use can reduce the importance of the system, or are more liable to be abandoned. A high level of IS continuance use should reflect the importance and the success of this IS system. As a result, many IS researchers start to feel the importance of the idea of continuance. Similarly, e-government research also postulates the importance of continuance: "Government initiatives to implement ICT will not alter the state of digital inequality unless there is continued use" (Hsieh *et al.* 2008, p. 98).

While much has been written about the importance of IS adoption, prior IS research fails to explain what happens beyond the initial adoption stage (Limayem *et al.* 2007). In addition, limited understanding exists concerning what it takes to sustain continued use (Hsieh *et al.* 2008; Lin & Rivera-Sánchez 2012; Zhao & Lu 2012). In recognizing this gap in the IS literature, a new stream of research studies examined the concept of IS continuance at the individual level (Bhattacherjee 2001; Limayem *et al.* 2007; Ortiz de Guinea & Markus 2009; Furneaux 2011). Across these studies, however, there is no unified definition of IS continuance. Bhattacherjee (2001, p. 351) explained continuance as "the long-term viability of an IS and its eventual success depends on its continued use rather than first-time use". He has identified perceived usefulness, expectation conformation and satisfaction as antecedents to IS

continuance. In comparison, Limayem *et al.* (2007) view IS continuance as behavioural patterns reflecting continued use of a particular IS. Table 3.3 shows different definitions of IS continuance.

Table 3.3 Definitions of continuance

| Definition | Reference |
|---|---|
| "Consumers' repurchase decisions, satisfaction, confirmation, and perceived usefulness determine users' intentions to continue to use an IS" | Terzis *et al.* (2013, p. 51) |
| "Continuance intention refers to the future continuation of satisfied customers" | Zhao *et al.* (2012b, p. 648) |
| "a form of post-adoption behaviour" | Chang (2012, p. 2) |
| "the extent to which a user intends to continue contributing his knowledge to virtual communities" | Zhao *et al.* (2012a, p. 2) |
| "an extension of acceptance behaviour, with models of this form suggesting, for instance, that initial perceptions of system usefulness change as a consequence of system use" | Furneaux (2011, p. 574) |
| "behavioural patterns reflecting continued use of a particular IS" | Limayem *et al.* (2007, p. 707) |
| "Long-term viability of an IS and its eventual success depends on its continued use rather than first-time use". | Bhattacherjee (2001, p. 351) |

Figure 3.5 below shows that only 7% of feature and function is used in a typical system. It also shows that 45% features and functions are never used in a typical system. If we add 19% of rarely used features and functions to 45% of never used features and functions, we will get 64% of unused features and functions of the system as a whole, which is more than half of the systems's features and functions.

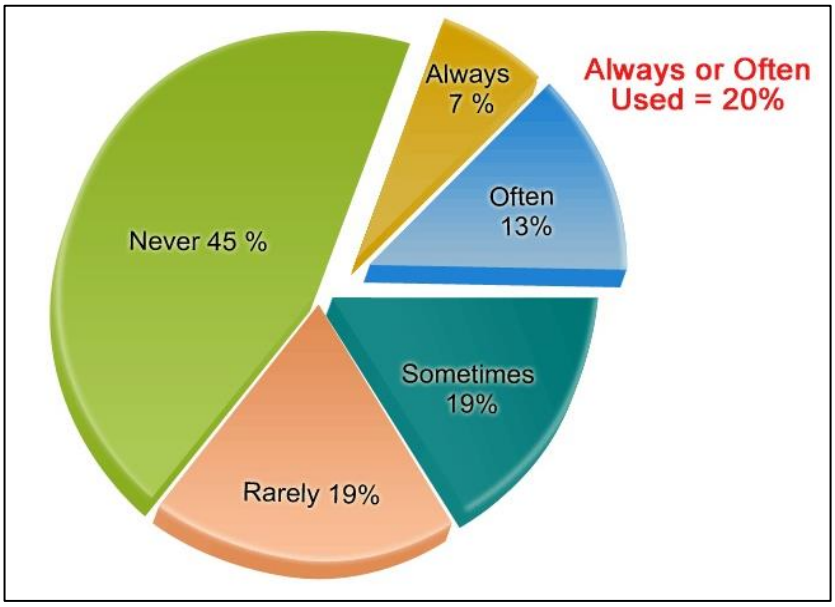


Figure 3.5 Feature and function used in a typical system (Standish Group International 2009)

For many businesses, especially those in the field of providing electronic services, continuance use at user level can be a cause for success, or failure. For example, for Internet service providers (ISPs), online retailers, online banks, online brokerages, online travel agencies, and the like, maintaining an effective subscriber base depends on both the number of initial adopters (new subscriptions) and the number of continued users (renew subscriptions) (Bhattacherjee 2001). Reducing costs is important for all organizations, and can be a strong motivator for the continuance of IS use. The importance of continuance comes from the fact that "acquiring new customers may cost as much as five times more than retaining existing ones, given the costs of searching for new customers, setting up new accounts, and initiating new customers to the IS" (Bhattacherjee 2001). Such trends can be another strong motivation to investigate the antecedents behind continuance use. The continuance concept also applies to non-electronic service providing businesses, for whom continuance is of paramount importance.

Unlike the private-sector practice, governments cannot mandate the continuing use of e-government services by citizens. On the one hand, business organizations often have mandatory enterprise IS use policies for employees, to prevent discontinuing use of the newly implemented enterprise resources planning (ERP) system, in favour

of switching back to the legacy application (Limayem *et al.* 2007). This way of promoting the continuing information system (IS) use is possible in the private sector because business organizations can influence normative employee behaviours. On the other hand, governments cannot influence the behaviour of e-government users by demanding a mandatory use of e-government services. Government agencies very often provide multiple service channels to meet the varying needs of citizens. Web-based e-government is only one of the service channel options available to citizens. So, while the initial use of e-government websites is an indicator of e-government success, it does not necessarily lead to the desired outcome unless a significant number of citizens move beyond the initial adoption and use of e-government websites on a continual basis (Wangpipatwong *et al.* 2009).

### 3.4.3 Expectation confirmation model of IS continuance

While most previous IS usage researches has focused on initial IS usage or acceptance, IS continuance has also gained increased attention among researchers (Bhattacherjee 2001; Bhattacherjee & Premkumar 2004; Limayem *et al.* 2007; Venkatesh & Goyal 2010) and has been influenced primarily by expectation-confirmation theory (ECT) (Oliver 1980).

ECT was extended by Bhattacherjee (2001) from the consumer behaviour literature to theorize a model of IS continuance which commonly referred to in the IS field as the expectation confirmation model (ECM) (see Figure 3.6). Bhattacherjee (2001, p. 351) explained continuance as "long-term viability of an IS and its eventual success depends on its continued use rather than first-time use". He has identified perceived usefulness, expectation conformation and satisfaction as antecedents to IS continuance. In this empirical study, expectation confirmation theory was adapted from the consumer behaviour literature and integrated with theoretical and empirical findings from prior IS usage research to theorize a model of IS continuance. His IS continuance model aimed to explain IS continuance intention by identifying confirmation and perceived usefulness as the first-order antecedents and (user) satisfaction as the second-order antecedent. The strongest association was found in Bhattacherjee (2001) explaining 41% of IS continuance. This study found that that users' continuance intention is determined by their satisfaction with IS use and perceived usefulness of continued IS use. Also, user satisfaction, in turn, is

influenced by their confirmation of expectation from prior IS use and perceived usefulness. Post-acceptance perceived usefulness is influenced by users' confirmation level.

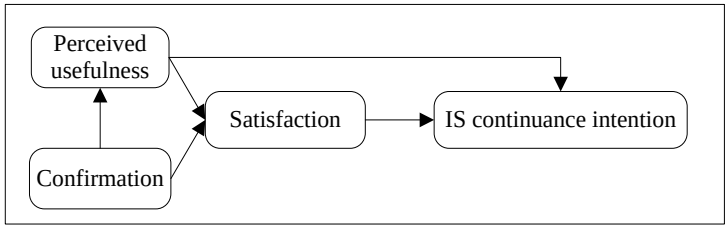


Figure 3.6 A post-acceptance confirmation model (Bhattacherjee 2001)

Limayem *et al.* (2007) study expands the conceptual model proposed by Bhattacherjee (2001) by exploring additional antecedents: habit, comprehensiveness of usage, and frequency of past behaviour. They argues that habit should be a moderating variable of between intentions and IS continuance behaviour, and added satisfaction, frequency of past behaviour, and comprehensiveness of usage are keys to habit formation. They define habit in the context of IS usage as "the extent to which people tend to perform behaviours (use IS) automatically because of learning" p. 705). This empirical study developed a model (see Figure 3.7 below) suggesting that continued IS usage is not only a consequence of intention, but also of habit. In this study model, they propose IS habit to moderate the influence of intention such that its importance in determining behaviour decreases as the behaviour in question takes on a more habitual nature. The results support the argument that habit acts as a moderating variable of the relationship between intentions and IS continuance behaviour, which may put a boundary condition on the explanatory power of intentions in the context of continued IS usage. The data also support that satisfaction, frequency of past behaviour, and comprehensiveness of usage are key to habit formation and thus relevant in the context of IS continuance behaviour.

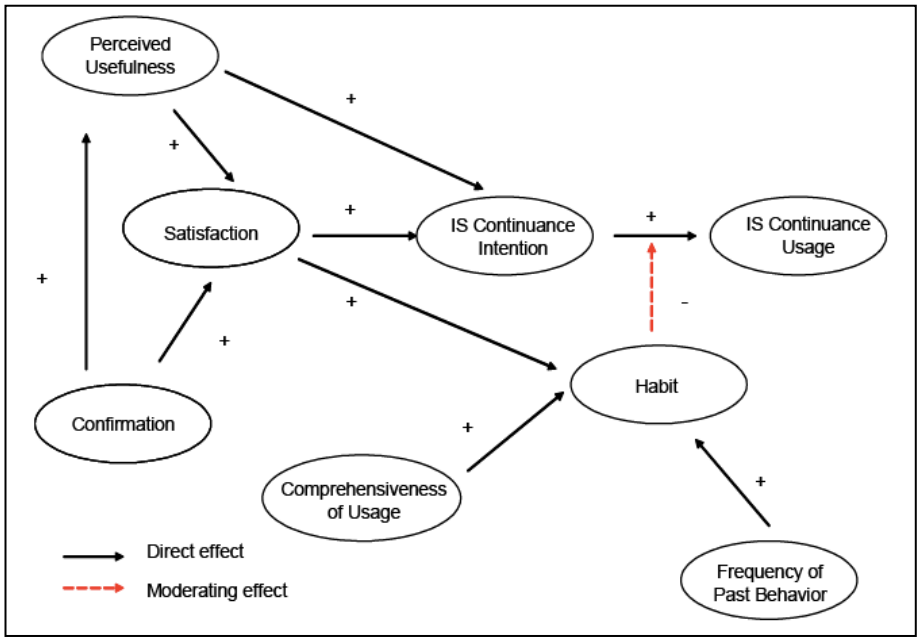


Figure 3.7 Extended IS continuance model (Limayem *et al.* 2007)

The direct and indirect effects of emotion on IT use have been studied in prior research by Beaudry and Pinsonneault (2010). This study was conducted to examine the direct and indirect relationships between emotions and IS use. This study has shown empirical evidence for emotion as a significant antecedent to IS continuance; the consequence.

As discussed above, the literature on IS continuance has shown positive correlations between IS continuance intention and the following antecedents: perceived usefulness, satisfaction, expectation confirmation, service quality emotion and habit.

#### 3.4.3.1 Intention to use

Fishbein and Ajzen (1975) define intention to use as strength of one's intention to perform a specified behaviour. Ajzen (1985), sees intention to use as an indication of an individual's readiness to perform a given behaviour. Intention to use is a measure of the strength of one's intention to perform a specified behaviour (Lean *et al.* 2009). Intention to use is a type of "self prediction" or "behavioural expectation", indicated as one of the most accurate predictors available for an individual's future behaviour (Davis 1989; Lean *et al.* 2009). Intention to use is a predictor of system use (Davis *et al.* 1989; Venkatesh *et al.* 2003; Venkatesh & Goyal 2010; Yang *et al.* 2012).

According to intention-based theories, user adoption and usage behaviour are determined by the intention to use IT (Lean *et al.* 2009). There is relationship between intention to use and individual's behaviour (Yang *et al.* 2012).

In the case of e-government, governments should consider the importance of citizen's awareness to e-government websites and look into the significant factors influencing citizen's intention to use e-government website (Wangpipatwong *et al.* 2008). There is more to be done to analyse factors influencing the intention to use e-government services (Lean *et al.* 2009).

In another study, Bhattacherjee (2001) proposed a model of IS continuance search to explain an IS user's intention to continuing use of IS based on expectation confirmation theory ECT (a widely used theory in the consumer behaviour to study consumer satisfaction, post-purchase behaviour, and so forth). The researcher used ECT considering IS users' continuance decision is like the consumer's repurchase decisions as both follow an initial adoption phase and influenced by the initial use, and they have the decision of continuing or discontinuing the use if IS. Bhattacherjee's model positively relates intention to satisfaction then positively relating perceived usefulness and confirmation to satisfaction. This model relies uniquely on intention as the primary predictor of IS continuance behaviour.

#### 3.4.3.2 Satisfaction

There has been an increase in the number of e-government studies that discuss satisfaction that users have with e-government (Reddick & Roy 2013). The concept of satisfaction has been widely used in many literatures, such as marketing (Austen *et al.* 2012; Hüttinger *et al.* 2012; Schiele *et al.* 2012; Aksoy *et al.* 2013; Veasna *et al.* 2013), commerce (Jaiswal *et al.* 2010), management and information systems (IS) (Welch *et al.* 2005; Palvia 2009; Verdegem & Verleye 2009; Alawneh *et al.* 2013; Reddick & Roy 2013; Stone & Baker-Eveleth 2013). One of the early satisfaction definitions is provided by Locke (1976) in the context of job performance. Satisfaction is defined as "a pleasurable or positive emotional state resulting from the appraisal of one's job" (Locke 1976, p. 1300). Oliver (1981, p. 29) extended this definition in the context of consumption context as "the summary psychological state

resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience". Both definitions emphasize a psychological or affective state related to and resulting from a cognitive appraisal of the expectation performance discrepancy 'confirmation' (Bhattacherjee 2001).

To understand the concept of satisfaction further, we need to discuss Bhattacherjee's (2001) analysis of this concept from an IS perspective. He articulates that satisfaction represents a psychological or affective state related to and resulting from a cognitive judgment of the expectation performance discrepancy (confirmation). This means that higher performance lead to greater confirmation, which in turn positively influences customer satisfaction and continuance intention. On the other hand, the reverse causes disconfirmation, dissatisfaction, and discontinuance intention. It is important to note that while this study investigated the IS continuance intention to use, it did not investigate the actual IS use. Another study by Limayem *et al.* (2007) argue that satisfaction is a key to building and sustaining the loyalty base of long-term consumers in the marketing literature. They also claimed that a similar argument can be made in the context of IS continuance. In their study, the satisfaction construct is considered as a key antecedent of IS continuance intention. It is also important to note that there has been no prior empirical research on the paths linking satisfaction, intention to use, and e-government continuance. "There is no empirical research that we are aware of, that examines satisfaction with contact channels and few public opinion surveys have been analysed examining citizens and their reactions to e-government" (Reddick & Turner 2012, p. 1).

#### 3.4.3.3 Perceived usefulness

Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance"(Davis 1989, p. 320; Seddon 1997). Perceived ease of use is defined as "the degree to which an individual thinks that using a particular system would be free of effort" (Davis 1989, p. 320). Attitude is defined as an individual's positive or negative feeling about performing the target behaviour (Davis *et al.* 1989; Taylor & Todd 1995; Venkatesh & Goyal 2010). As in the definition, perceived usefulness usually reflects people decision to use a system or not, based on their believe about how the system will affect their

performance and productivity (Liaw & Huang 2013; Yoon & Barker Steege 2013). A system that has a high degree of usefulness is a system where the users believe that system capable of used advantageously. Earlier studies have supported that perceived usefulness has a direct effect on behavioural intention to use IS e.g. Lee (2008); Van Raaij and Schepers (2008); Terzis *et al.* (2013).

A various researchers inspired by technology acceptance model (TAM), theory of planned behaviour (TPB), and related theories, has examined the effects of user beliefs and attitude on IT usage intention and behaviour e.g., Ajzen and Fishbein (1977); Davis (1989); Bhattacherjee and Premkumar (2004); Wangpipatwong *et al.* (2008); Cheung and Vogel (2013); Hung *et al.* (2013); Padilla-Meléndez *et al.* (2013). The technology acceptance model which is provided by Davis (1989), has been widely used to predict user acceptance of technology based on user perceptions of usefulness, ease of use, and attitude (Cheung & Vogel 2013; Padilla-Meléndez *et al.* 2013). TAM theorized that user perceptions of usefulness and ease of use of a target system determine the user's behavioural intention to use the system (Venkatesh & Goyal 2010). Behavioural intention is a predictor of system use (Davis *et al.* 1989; Venkatesh *et al.* 2003; Venkatesh & Goyal 2010). TAM also suggests that the effects of external variables, such as training and system design characteristics, on behavioural intention and use are mediated by the two key beliefs: perceived usefulness and perceived ease of use (Davis *et al.* 1989; Venkatesh & Goyal 2010).

Seddon (1997) presented and justified a respecified and slightly extended version of DeLone (1992) model. In his model "Model of IS Success", he made perceived usefulness as an antecedent of user satisfaction. He claims that perceived usefulness and user Satisfaction are potentially useful for many studies because they are conceptually meaningful, and relatively easy to measure.

Perceived usefulness is introduced to the IS continuance literature by Bhattacherjee (2001), a post-acceptance confirmation model, the Expectation-Confirmation Model (ECM), based on expectation-confirmation theory (ECT) (Oliver 1980) and TAM (Davis 1989). ECT supports that satisfaction is the most important variable regarding

continuance use of a product or a service, and it examines both pre-consumption and post-consumption variables in order to define satisfaction, while, TAM supports that the intention to use a system is defined by perceived usefulness and perceived ease of use (Terzis *et al.* 2013). Perceived usefulness showed also a strong effect on continuance intention to use (Bhattacherjee 2001; Lin *et al.* 2005; Ham *et al.* 2012; Stone & Baker-Eveleth 2013; Terzis *et al.* 2013). In the IS continuance literature also, Thong *et al.* (2006) includes perceived usefulness to predict user satisfaction in their model. In fact, many studies used perceived usefulness to predict satisfaction in IS continuance literature such as Limayem *et al.* (2007) Wangpipatwong *et al.* (2008); Hossain *et al.* (2009).

Perceived usefulness was used to measured post-acceptance expectations and was the only construct consistently influencing user intention in both adoption and post-adoption phases (Terzis *et al.* 2013). Lin and Wang (2012) and Verhagen *et al.* (2012) recommended that perceived usefulness has a strong influence on the use of a system in general to perform tasks. Detlor *et al.* (2013) suggested that perceived usefulness has a strong influence on e-government use.

## 3.5 Expectation Confirmation model extension

### 3.5.1 Habit

Much of prior IS research has focused on the initial adoption and use of IS under the assumption that IS use can be determined only by studying intention to use (Limayem *et al.* 2007; Ortiz de Guinea & Markus 2009; Limayem 2011; Polites & Karahanna 2013). *However, these prior studies do not take into account the potential impact of habit on IS use* (Karahanna *et al.* 1999; Verplanken & Aarts 1999; Nilsen *et al.* 2012; Polites & Karahanna 2012; Venkatesh *et al.* 2012; Olsen *et al.* 2013; Polites & Karahanna 2013). Habit can be defined as "learned sequences of acts that become automatic responses to specific situations, which may be functional in obtaining certain goals or end states" (Verplanken *et al.* 1997, p. 540). So habit is viewed here as a learned response. While some authors argue that habit can form quickly as a result of imagined interaction or responses (Thorngate 1976), others such as Limayem *et al.* (2007) in their research on IS use, define habit as the extent

to which people tend to perform behaviours (use IS) automatically because of learning. They strongly argue that the development of habit requires a certain amount of repetition or practice. Once habit is formed, behaviour is performed automatically (Orbell *et al.* 2001; Wood *et al.* 2002). That means that the behaviour is performed with little conscious attention and minimum amount of mental effort (Wood *et al.* 2002). Therefore, the more habit is formed, the less conscious effort is needed to perform the behaviour (Limayem *et al.* 2007).

Interestingly, Limayem *et al.* (2007) explored the role of habit in their study's two models. In the first model, habit is viewed *as an independent variable* having a direct effect on IS continuance usage. The results of this model showed a standardized beta for habit and intention of 0.235 and 0.609 respectively, and an $R^2$ of 0.211 for IS continuance usage. In contrast, in the second model, habit is viewed *as a moderator variable* in moderating the strength of the postulated relationship between IS continuance intention and IS continuance usage. The results of this model showed that 58.4 % of the variance in IS was due to continuance intention, while 22.4 percent of the variance was due to habit. They concluded their findings by supporting the argument that habit acts as a moderating variable of the relationship between intentions and IS continuance behaviour.

Drawing on the psychological literature on habit, prior research has largely treated habit as *an independent variable* or a predictor of actual behaviour. Habit and intention, separately or together, act as predictors of actual behaviour (Hong-wen *et al.* 1988; Tuorila & Pangborn 1988). In contrast, Towler and Shepherd (1992) found that habit and intention, independently of each other, influenced actual behaviour. Finally, Saba *et al.* (2000) found that habit in the model was the most important predictor of the actual behaviour. Similarly, prior research on habit in the IS literature tends to view habit *as an independent variable*. For example, one recent study concluded: "Habit has a direct effect on technology use" (Venkatesh *et al.* 2012, p. 158). Their results suggest that there is a significant impact of habit on personal technology use as a direct and automatic effect. Furthermore, while Trafimow (2000) analysed the relationship between habit and intention to behave as

a proxy for actual behaviour, *he concluded that future research should examine a direct effect of habit on actual behaviour*.

While the literatures still lack general consensus on the role of habit on continuance as reviewed, this author argues that habit is treated as an antecedent, rather than a moderator. Based on an analysis of the literature, it is also worthwhile to include known key antecedents of habit in order to develop a better understanding of e-government continuance. There are three key antecedents to habit: satisfaction, service comprehensiveness, and frequency of past behaviour. In this research, all three antecedents will be included in the research model to test and evaluate their associations with habit. Habit's direct association with e-government continuance will also be tested.

#### 3.5.1.1 Frequency of past behaviour

Social cognitive theories provide insight into how individuals process information and analytical procedures and carefully plan actions, but they have limitations when it comes to explain repeated behaviours that do not need an ongoing, contemplative decisional process (Nilsen *et al.* 2012). A key precondition for the development of habit is the repetition of particular behaviour (Limayem *et al.* 2007). The more frequently it is performed, the more likely it is that the cognitive processes involved will take on an automatic nature (Ronis *et al.* 1989; Limayem *et al.* 2007; Gardner *et al.* 2012; Rühle *et al.* 2012). Gochman (1997) indicates that forming a habit requires repeating behaviour frequently over time. It has been estimated that approximately 45% of everyday behaviours tend to be repeated in the same physical location everyday (Nilsen *et al.* 2012). For example, if an email user checks his/her email several times a day, he/she will eventually check the email account automatically. By contrast, if somebody who uses email only irregularly may never really "get into the habit" and will always have to form specific intentions to "do it".

With enough frequency of behaviour, individuals will increase their adequate practice. This implies that familiarity with the behaviour tends to increase such that the behaviour can subsequently be performed with almost no cognitive effort (Limayem *et al.* 2007). Therefore, the more often an individual performs behaviour,

the more likely it is that the behaviour will become habitual (Charng *et al.* 1988). Repeated behaviour can establish attitudes and intentions that can be triggered by attitude, objects or cues in the environment (Venkatesh *et al.* 2012). The strength of the resulting habit, as defined by the degree to which people are likely to execute behaviours automatically, is also directly associated with the frequency with which the behaviour is performed: the higher the frequency, the stronger the habit (Limayem *et al.* 2007). Habits develop and get strength by satisfactory repetition, and over time become automatic. As a result, that repeated behaviour can happen without awareness and self-instruction (Olsen *et al.* 2013).

On the other hand, while repeating behaviour is a habit requirement (Jasperson *et al.* 2005), repeated occurrence is not habit itself (Limayem *et al.* 2007). In order to form a habit, the behaviour should be repeated on a regular basis in a stable context or the same environment (Limayem *et al.* 2007; Gardner *et al.* 2012). Stable context will be discussed below.

#### 3.5.1.2 Service comprehensiveness

Comprehensiveness of usage refers to "the extent to which an individual makes use of the various applications offered under the umbrella of a single IS system" (Limayem *et al.* 2007, p. 715). Comprehensiveness of use may strengthen IS habits through simply increasing opportunities for repetition, by using the system across various tasks (Polites & Karahanna 2013). For the context purpose of this thesis, I will be using the term "service comprehensiveness" instead of using the term "comprehensiveness of usage". This study will pay more attention to comprehensiveness of usage and its relation to habit, because most IS researchers have not succeeded in addressing this relation. "The concept of comprehensiveness of usage (or similar) has not received any attention in the general habit literature" (Limayem *et al.* 2007, p. 715). This thesis will take service comprehensiveness and its relation to habit in the context of e-government usage. By studying service comprehensiveness, I will explain how to distinguish between individuals who use a multiservice e-government system for many different purposes, and those who don't consider using e-government services because of a lack of the comprehensiveness of e-government services. In the context of IS, an empirical study confirms the positive

relation between comprehensiveness of usage and habit (Limayem *et al.* 2007). However, e-government scholars were unsuccessful in investigating this relation. In this thesis, I will empirically examine the effect of the strength of comprehensiveness of e-government services on habit.

#### 3.5.1.3 Stable Context

Over time, use of the new system may become habitual if an individual selects the system frequently enough, in a stable context, and with satisfactory results (Polites & Karahanna 2013). A relatively stable context is another important prerequisite for habit development (Limayem *et al.* 2007). Individual routines that are performed repeatedly in the same manner, with satisfactory experience, and in a stable context will, over time, have a tendency to become automated and become a habit (i.e., initiated outside awareness, in a mentally efficient manner, and without conscious control) (Polites & Karahanna 2013). When behaviours lead to satisfactory outcomes and where the work context is stable, such behaviours may become a habit (Jasperson *et al.* 2005). When online shopping behaviour is repeatedly executed in a stable context, it becomes a habit (Kim & Malhotra 2005).

The habit literature commonly refers to choices as scripted behaviours that, over time, can become automated and be performed outside of consciousness, if performed frequently enough in a stable context (Polites & Karahanna 2013). Stable contexts facilitate the propensity to perform repeated behaviours with minimal cognitive monitoring (Limayem *et al.* 2007; Zhao *et al.* 2012a; Olsen *et al.* 2013; Polites & Karahanna 2013). On the other hand, when people are consciously deliberating about acts, they tend to evaluate the outcomes of the behaviour (e.g., attitudes) in a careful and thoughtful manner before they form intentions (Zhao *et al.* 2012a). For example, familiarity with the website interface and transaction procedures will cause buyers to feel that they are shopping in a stable context, which will facilitate their propensity to perform repeated behaviour with minimal cognitive monitoring (Chiu *et al.* 2012). Most importantly, with stable contexts, past behaviour has a direct effect on future behaviour over and above the effect of intention (Jasperson *et al.* 2005).

A stable context is characterized by the presence of similar situational cues and goals across more or less regularly occurring situations (Limayem *et al.* 2007). A stable context means that situational cues and relevant goals of the individual are similar (or the same) across consecutive situations (Limayem *et al.* 2007; Polites & Karahanna 2013). Once an individual has decided to do a certain course of action, and if the outcome of that action is satisfactory, the next time when a similar situation arises, the individual already knows what to do to achieve success (Limayem *et al.* 2007; Ortiz de Guinea & Markus 2009; Polites & Karahanna 2012; Polites & Karahanna 2013). As discussed above, with more behaviour repetitions in the same context, this behaviour can turn into habit. This habit-driven process may now only be interrupted if major properties of the situation change (e.g., the equipment to perform the action is no longer there or the user's goals have changed) (Limayem *et al.* 2007).

Even though it has been argued above that a stable context is an important antecedent of habit formation, I did not include this variable in this thesis research model because the data is collected in a controlled stable context. I ensured the stability of the context by collecting the data from Saudi students who are using the Saudi Ministry of Higher Education (MOHE) portal. This portal has the same environment and procedures for all Saudi students worldwide. By doing so, I assumed that the single study context represented a stable context for all survey respondents.

### 3.5.2 Emotion

Many Information systems use researchers have been exploring the cognitive models, emphasizing the role of habit behaviour that does not require conscious effort. However, researchers in psychology keep showing that cognitive models never capture all the antecedents of user behaviour. The emotional side and its relation to IS use, has received less attention (Ortiz de Guinea & Markus 2009; Beaudry & Pinsonneault 2010; Stein *et al.* 2012). In addition, while much is known about different use behaviours, and cognitive and technical factors that influence IS use, less is known about the role of emotional factors in users' choices to continue using a new technology post adoption (Stein *et al.* 2012).

Emotion is defined as a "mental state of readiness that arises from cognitive appraisals of events or thoughts" (Bagozzi *et al.* 1999, p. 184). Also, Stein *et al.* (2012, p. 4) defines emotion as "an episode of interrelated, synchronized changes in the states of all or most of the five organism subsystems, in response to the evaluation of an external or internal stimulus event, as relevant to major concerns of the organism". In both definitions the relationship between the emotion and the behaviour are important. There are few studies exploring this relationship, either between emotion and IS use, or between emotion and IS continuance use. All these studies emphasise the relationship between emotions and IS continuance use.

A prior study by Beaudry & Pinsonneault (2010), explores the direct and indirect effects of emotion. This study provides a complementary perspective to understand acceptance and antecedents of IT use. In this study, four types of emotion were classified. Those pertaining to challenge, achievement, loss and deterrence. This study was conducted to show the direct and indirect relationships between four emotions (excitement, happiness, anger, and anxiety) and IS use. This study indicated that excitement and happiness were positively related to IT use. Anger and anxiety were not related to IT use directly, but they were positively related to seeking social support. This study has shown empirical evidence for emotion as a significant antecedent to IS use, explaining 47% of IS use. This study shows that emotions felt by users early in the implementation of a new IT have important effects on IT use. By showing the importance and complexity of the relationships between emotions and IT use, the paper calls for more research on this relationship.

In other research on IS continuance, Ortiz de Guinea & Markus (2009) explore a hybrid theory, by studying mixing behaviour that is not consciously controlled, such as habit and the influences of emotion on the IS continuing use. They claim that the current literature on habitual behaviour (behaviour that is not consciously controlled) and the influences of emotion on behaviour suggest that planned behaviour and reasoned action may not provide the best theoretical foundation for the study of continuing IT use. Thus, they call for empirical research that directly compares and contrasts the consensus theory of continuing IT use, with rival theories that place much greater emphasis on unplanned and unreasoned action. The significance of this

study is that it went beyond the tradition of IS theorizing about planned behaviour and reasoned action, to study the effect of the emotion on the IT continuance use.

### 3.5.3 Service quality

Information quality refers to the quality of information that a government needs to make available on its website (Wangpipatwong *et al.* 2005). System quality is concerned with the measure of the actual system which produces the output (DeLone 1992). System quality is defined as the features and performance of e-government websites from the citizen's point of view, and the quality of e-government websites in use (Wangpipatwong *et al.* 2005).

Providing quality e-government services to citizens makes interactions between citizens and government agencies smoother, easier, and more efficient (Prybutok *et al.* 2008). This, in turn, has the potential to facilitate better relationships between the government and the public. However; poor quality can have a detrimental effect and can be a barrier to e-government service usage (Prybutok *et al.* 2008). Gilbert *et al.* (2004) explored factors related to e-government usage and they found that service quality was a predictor of e-government failure or success. Because the Internet has become increasingly essential in communication between governments and their citizens, it is important for governments to provide quality e-services that minimize adoption barriers and maximize benefits (Prybutok *et al.* 2008).

Service quality matters in terms of how the system can be effectively designed and managed to enhance user experiences (Zheng *et al.* 2012). Empirical evidence suggests that service quality generally plays a very important role in online business environments (Reichheld & Schefter 2000; Deng *et al.* 2010; Wells 2011). Service quality can be defined as the difference between customers' expectations for service performance prior to the service encounter, and their perceptions of the service received (Asubonteng *et al.* 1996). Excellent service quality impacts satisfaction and, ultimately, adoption (Reichheld *et al.* 2000; Cristobal *et al.* 2007). Thus, when performance does not reach expectations, people will consider quality to be low, and when performance exceeds expectations, the perception of that quality improves

(Connolly 2007; Aladwani 2013). So, in any evaluation of service quality, customers' expectations are fundamental to that evaluation (Connolly 2007).

In the e-government research field, Kumar et al. (2007) studied the effect of service quality on citizen satisfaction, which then influences e-government use. They have shown significant empirical evidence for significant and direct relationships between service quality and satisfaction, and between satisfaction and e-government use. In addition, Asubonteng *et al.* (1996) suggested that, if service quality increases satisfaction with the service, then the intention to reuse the service will increase.

In addition, Zhao *et al.* (2012b) explores the effects of service quality on customer satisfaction, which, affects continuance intention to use IS. This research model was developed based on a multi-dimensional approach, and was empirically examined with data collected from about one thousand IS users. The result of this research shows that all three dimensions of service quality (interaction quality, environment quality and outcome quality) have significant and positive effects on satisfaction. Additionally, customer satisfaction has significant and positive effects on continuance intention. The main limitation of this research is that the survey was performed in China. While the research results may reflect the situation in China, there are many differences between the cultures of China and the cultures of other countries, casting some uncertainty over its validity. Therefore, this thesis calls for more testing of the research model and the corresponding hypotheses in other population groups and geographical contexts, which is necessary in order to improve the results in general. This thesis also calls for further investigation into other factors influencing customer satisfaction and continuance intention, such as customer expectation.

Zheng *et al.* (2012) proposed a research framework to investigate virtual community (VC) users' continuance intention from a service quality perspective. This empirical study found that information and system quality directly affect perceived individual benefits and user satisfaction, which eventually determine the user continuance intention to use and to provide information. Also, this study found that higher quality facilitates the transformation of VC resources to increases users' positive attitudes

toward the community, which leads to users' intention to continue using the VC. In other words, IS quality matters in the IS post-adoption stage. This study suggested that information and system quality are critical in retaining existing VC users. It also called for more ideas on quality control of user-generated contents, system design and individual benefits.

Wangpipatwong *et al.* (2009) conducted a study to exam service quality, and how it enhances the continued use of e-government Web sites by citizens. This study was motivated by the lack of empirical studies that use service quality to examine the continued use in the context of e-government. This study considered information quality, system quality, and service quality as parts of the e-government service quality. The results revealed that service quality enhanced the continued use of e-government services. The results also revealed that the higher the level of information quality, system quality, and service quality, the higher the citizens' intention to continue using e-government services. The results confirm that information quality, system quality, and service quality improve not only initial intention to use as asserted by (DeLone & McLean 2002), but also the continued use of e-government services. (In this thesis, service quality will be regarded as a combination of information quality and system quality).

## 3.6 Summary

This chapter started by providing e-government definitions and concepts. Then it gave a detailed view of e-government use, including the problem of the low level of e-government use. After that, it gave a comprehensive view of the literature relevant to this research, including all constructs used in this research model.

# CHAPTER 4: RESEARCH MODEL

## 4.1 Introduction

This chapter will present the research questions and introduces the proposed research model and related hypotheses. This chapter is divided into three main sections. The first is the research objectives and questions. The second is the "construct of interest" which will be defined, based on the literature review in chapter 3. The third section presents the proposed research model and explains how it was developed. It also introduces and provides the justification for each of the hypotheses associated with the model.

## 4.2 Research objectives and questions

This research aims to identify and examine factors that influence citizens to continually use the e-government services. The focus of this research is only on the government to citizen (G2C) e-services in Saudi Arabia. This research aims to increase our knowledge and understanding of direct and indirect factors that influence the continuance use of e-government services. By doing this, we can increase the level of continuing use of e-government services. To address the research objectives, two high level research questions were proposed:

1. What are the key factors that influence e-government continuing use in Saudi Arabia?
2. How strongly do these factors influence citizens to continue using e-government services?

Based on the literature review in chapter3, there are a number of direct and indirect factors that influence the continuance use of e-government services. These factors will be defined in the next section.

## 4.3 Constructs of interest

This research assumes that the success of the Saudi e-government project will be influenced by the citizens' continuing use of these services. That is because Saudi Arabia invested heavily in the Saudi e-government project, but at the same time there is a low level of usage of e-government services. Similar problem of low e-government use has occurred worldwide as discussed in chapter 3. Hence, this research will examine the set of factors believed to be most likely to influence the level of e-government usage by the citizens. These factors are: e-government continuance, intention to use, perceived usefulness, satisfaction, habit, confirmation, service quality, service comprehensiveness and frequency of past behaviour. Most of these factors have not yet been studied sufficiently in the context of e-government, especially the Saudi e-government. The next sections will provide definitions of each factor that is relevant in the context of this research.

### 4.3.1 E-government continuance

Information systems continuance is defined as "Long-term viability of an IS and its eventual success depends on its continued use rather than first-time use" (Bhattacherjee 2001, p. 351). Limayem *et al.* (2007, p. 707) defined information systems continuance as "behavioural patterns reflecting continued use of a particular IS". In the context of this study, e-government continuance is defined as behavioural patterns reflecting continued use of e-government services.

### 4.3.2 Intention to use

Fishbein and Ajzen (1975) define intention to use as the strength of one's intention to perform a specified behaviour. Ajzen (1985), sees behaviour intention as an indication of an individual's readiness to perform a given behaviour. In the context of this study, intention to use is defined as an indication of citizens' readiness to use e-government services.

### 4.3.3 Perceived usefulness

Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance"(Davis 1989, p. 320). As in the definition, perceived usefulness usually reflects people's decisions to use a

system or not, based on their belief about how the system will affect their performance and productivity. Perceived usefulness in the context of this study is the degree to which a citizen believes that using e-government services would enhance his or her job performance.

### 4.3.4 Satisfaction

The concept of satisfaction is widely used in many fields of study, such as marketing, commerce, management and information systems (IS). One of the early satisfaction definitions is a definition by Locke (1976) in the context of job performance. Satisfaction is defined as "a pleasurable or positive emotional state resulting from the appraisal of one's job" (Locke 1976, p. 1300). Oliver (1981, p. 29) extended this definition in the context of the consumption context to be “the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience". Both definitions emphasize a psychological or affective state related to, and resulting from, a cognitive appraisal of the expectation performance discrepancy ‘confirmation’ (Bhattacherjee 2001). In the context of this study, satisfaction is defined as a pleasurable or positive emotional state resulting from the appraisal of using e-government services.

### 4.3.5 Confirmation

Expectation confirmation theory (ECT) posits that user satisfaction is determined by two constructs: expectation of the IS and confirmation of expectation following actual use (Ortiz de Guinea & Markus 2009). Expectation provides the baseline level, against which confirmation is assessed by users to determine their evaluative response or satisfaction (Bhattacherjee 2001). Confirmation is defined as the users' perception of the congruence between expectation of IS use and its actual performance (Bhattacherjee 2001). In the context of this study, confirmation is defined as the users' perception of the congruence between expectation of e-government services use and its actual performance.

### 4.3.6 Service quality

Information quality refers to the quality of information that a government needs to make available on its website (Wangpipatwong *et al.* 2005). System quality is

concerned with the measure of the actual system which produces the output (DeLone 1992). System quality is defined as the features and performance of e-government websites from the citizen's point of view, and to the quality of e-government websites in use (Wangpipatwong *et al.* 2005). According to a review of related literature (Wangpipatwong *et al.* 2005; Kumar *et al.* 2007; Wangpipatwong *et al.* 2009), the fundamental dimensions of service quality are performance, importance, reliability, information quality and system quality. This thesis focuses on two dimensions of the service quality, which are, information quality and system quality. Information quality is concerned with the measure of the information that the system produces and delivers (DeLone 1992).

In this study, service quality refers to the combination of information quality and system quality. Information quality means the information accuracy (free from errors) and information timeliness (up-to-date). System quality means system functionality (the system works correctly and provides necessary transactions). So, in the context of this study, service quality is defined as the combination of information quality (accuracy and timeliness) and system quality (system works correctly and provides necessary transactions).

### 4.3.7 Habit

Habit can be defined as learned sequences of acts that become automatic responses to specific situations, which may be functional in obtaining certain goals or end states (Verplanken *et al.* 1997). Limayem *et al.* (2007), in their research on IS usage, define habit as the extent to which people tend to perform behaviours (use IS) automatically because of learning. In the context of this study, habit is defined as the extent to which citizens tend to use e-government services automatically because of learning.

### 4.3.8 Service comprehensiveness

Service comprehensiveness refers to the extent to which an individual makes use of the various applications offered under the umbrella of a single IS system (Limayem *et al.* 2007). Service comprehensiveness means providing all the required and different services to the users of the e-government to be able to achieve their tasks.

### 4.3.9 Frequency of past behaviour

With sufficient frequency, the individual gains adequate practice. This implies that the familiarity with the behaviour tends to increase, such that the behaviour can subsequently be performed with almost no cognitive effort (Limayem *et al.* 2007). Therefore, the more often an individual performs behaviour, the more likely it is that the behaviour will become habitual (Charng *et al.* 1988). In this study, frequency of past behaviour is defined as the frequency of repetition of using the e-government services.

### 4.3.10 Emotion

Emotion can be defined, for the purposes of this study, as a mental state of readiness for action, that promotes behavioural activation and helps prioritize and organize behaviours, in ways that optimize individual adjustments to the demands of the environment (Bagozzi *et al.* 1999). It is known that emotional control has a significant impact on our decisions, actions and attitudes.

In summary Table 4.1 below provides all the definition of the salient constructs to be examined in the context of the study.

Table 4.1 Construct definitions

| Construct | Definition |
|---|---|
| E-government continuance | Behavioural patterns reflecting continued use of e-government services |
| Intention to use | An indication of citizens' readiness to use e-government services |
| Perceived usefulness | The degree to which a citizen believes that using e-government services would enhance his or her job performance. |
| Satisfaction | A pleasurable or positive emotional state resulting from the appraisal of using e-government services. |
| Confirmation | The users' perception of the congruence between expectation of e-government services use and its actual performance. |
| Service quality | The combination of information quality (accuracy and timeliness) and system quality (system works correctly and system provides necessary transactions). |
| Habit | The extent to which citizens tend to use e-government services automatically because of learning. |
| Service comprehensiveness | Providing all the required and different services to the users of the e-government to be able to achieve their tasks. |
| Frequency of past behaviour | The frequency of repetition of using the e-government services. |

| | |
|---|---|
| Emotion | Mental state of readiness for action, that promotes using e-government services and helps prioritize and organize, using e-government services in ways that optimize individual adjustments to the demands of the environment |

## 4.4 Research model and hypothesis

The overarching goal of this study, which is grounded in expectation confirmation theory and extending the literature on IS continuance, is to address the problem of low-level e-government use. This research pays special attention to the dimension of low-level use, which is measured by the gap between available e-services and actual use (or lack thereof) as discussed in Chapter 3. It is assumed in this research that, once users adopt and start using e-government services, if thorough continuance is optimally facilitated, then they will explore available e-services increasingly to close the gap. There is another dimension of low-level use, which is measured by the low number of adopters and initial-stage users, which this research does not explicitly address.

The goal is achieved by developing a new conceptual model of e-government continuance, and testing this model through empirical online survey research. This empirical research is expected to provide a better theoretical understanding of the antecedent factors influencing the continued use of e-government services. This research model draws on expectation confirmation theory (Oliver 1980) and the conceptual model of IS continuance developed by Limayem *et al.* (2007). Figure 4.1 below shows the new research model developed for this empirical research.

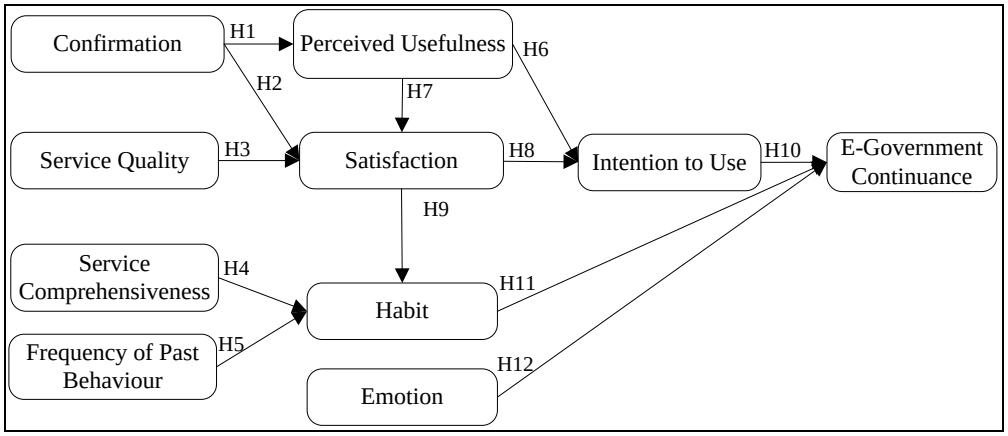


Figure 4.1 The research model

The proposed model has 12 related hypotheses. Each one of these hypothesized relationships will be presented and justified as follows:

Many authors have investigated the direct impact of confirmation on satisfaction (Meng *et al.* 2004; Asgarkhani 2005; Au *et al.* 2008; Venkatesh & Goyal 2010; Zhang *et al.* 2011; Chang & Zhu 2012; Chou *et al.* 2012), however, fewer have studied the relationship between confirmation and perceived usefulness. Bhattacherjee (2001); Thong *et al.* (2006); Limayem *et al.* (2007) are among those who have studied this relationship, but their studies were not in the e-government context. Hossain *et al.* (2009) has studied this relationship in the context of e-government. This study showed that confirmation directly impacts perceived usefulness significantly. In this research, this relationship will be studied in the context of e-government. Therefore, and consistent with the literature, the following hypothesis is proposed.

**Hypothesis H1:** There is a direct and positive relationship between confirmation and perceived usefulness.

As previously discussed, many authors have investigated the direct impact of confirmation on satisfaction (Meng *et al.* 2004; Venkatesh & Goyal 2010; Zhang *et al.* 2011), but all these studies were not yet tested in the context of e-government. Actually, the relation between confirmation and satisfaction was borrowed from Oliver (1980), in combination with the expectation confirmation theory (ECT) as a solid part of this research model. ECT was brought from the marketing context, because it is a theory widely used to study consumer satisfaction and post-purchase behaviour, which is part of our understanding of e-government post-adoption behaviour. Venkatesh and Goyal (2010) also emphasise the relationship between confirmation and satisfaction. Bhattacherjee (2001) found in his study that confirmation is a strong predictor of satisfaction. However, these studies were not in the e-government context. Therefore, the following hypothesis is proposed.

**Hypothesis H2:** There is a direct and positive relationship between conformation and satisfaction.

Despite the many studies which show that service quality is a strong predictor of satisfaction (Cristobal *et al.* 2007; Au *et al.* 2008; Deng *et al.* 2010; Zhao *et al.* 2012b; Aladwani 2013; Chee-Wee *et al.* 2013), most of those studies consider service quality as information quality or system quality. In addition, even fewer studies explore this relationship in the e-government context. For example, Kumar *et al.* (2007) proposed the importance of the relationship between service quality and satisfaction, but without empirically testing it. Wangpipatwong *et al.* (2009) emphasises the importance of this relationship in the context of Thailand's e-government. Sandoval-Almazan and Gil-Garcia (2010) found in their empirical study that there are important limitations related to infrastructure, use of software, and the development of their websites. These limitations can affect the level of e-government service quality. This study suggested studying e-government service quality from two sides (information quality and system quality).

In this thesis, service quality will include the information quality and system quality, to ensure a comprehensive look at the e-government service quality. Therefore, the following hypothesis is proposed.

**Hypothesis H3:** There is a direct and positive relationship between service quality and satisfaction.

In the context of IS, an empirical study has confirmed the positive relationship between service comprehensiveness and habit (Limayem *et al.* 2007; Chiu *et al.* 2012; Detlor *et al.* 2013). However, e-government scholars failed to investigate this relation. In this study, service comprehensiveness means providing all the required and different services to the users of the e-government to be able to achieve their tasks. The concept of service comprehensiveness (or similar) has not received any attention in the general habit literature (Limayem *et al.* 2007). This study will pay more attention to service comprehensiveness and its relationship to habit. This study will investigate the relationship between service comprehensiveness and habit in the context of e-government. By studying the service comprehensiveness, I will explain the ability to distinguish between individuals who use a multiservice e-government

system for many different purposes, and those who don't consider using e-government services because of the lack of comprehensiveness of e-government services.

This thesis will empirically examine the strength of the relationship between comprehensiveness and habit regarding e-government services. Therefore, the following hypothesis is proposed.

**Hypothesis H4:** There is a direct and positive relationship between service comprehensiveness and habit.

A key precondition for the development of habit is the repetition of particular behaviour (Limayem *et al.* 2007). The more frequently it is performed, the more likely it is that the cognitive processes involved will take on an automatic nature (Limayem *et al.* 2007). For example, if an e-mail user checks his/her e-mail several times a day, he/she will eventually check the e-mail account automatically. By contrast, if somebody who uses e-mail only irregularly may never really "get into the habit" and will always have to form specific intentions to "do it".

With sufficient frequency, the individual gains adequate practice. This implies that the familiarity with the behaviour tends to increase, such that the behaviour can subsequently be performed with almost no cognitive effort (Limayem *et al.* 2007; Venkatesh *et al.* 2012; Olsen *et al.* 2013). Therefore, the more often an individual performs a behaviour, the more likely it is that the behaviour will become habitual (Charng *et al.* 1988). The strength of the resulting habit, as defined by the extent to which people tend to perform behaviours automatically, is also directly related to the frequency with which the behaviour is performed: the higher the frequency, the stronger the habit (Limayem *et al.* 2007). Therefore, the relationship between frequency of past behaviour and habit in the context of e-government will be tested. The following hypothesis is proposed.

**Hypothesis H5:** There is a direct and positive relationship between frequency of past behaviour and habit.

In the information systems literature, there are two streams of thought in studying the relationship between perceived usefulness and intention to use. The first stream is studying this relationship as a part of the technology acceptance model (TAM) which was first brought to the literature by Davis (1989). In this stream, authors usually add different extensions to TAM, then test their models (Kim & Malhotra 2005; Kim & Son 2009; Padilla-Meléndez *et al.* 2013; Stone & Baker-Eveleth 2013; Terzis *et al.* 2013). In these studies, there is always some evidence showing the important role of perceived usefulness on intention to use. In the same stream, but in the context of e-government, there are many studies testing this relationship as part of TAM, showing a strong relationship between perceived usefulness and intention to use (Wangpipatwong *et al.* 2008; Hamner & Al-Qahtani 2009; Mahadeo 2009; Segovia *et al.* 2009; Stafford & Turan 2011).

The second stream is studying the relationship between perceived usefulness and intention to use as a part of expectation confirmation theory (ECT). In this stream, there are many studies emphasizing the importance of this relationship (Bhattacherjee 2001; Thong *et al.* 2006; Limayem *et al.* 2007; Venkatesh & Goyal 2010). However not all of these studies are in the context of e-government. Thus, the following hypothesis is proposed.

**Hypothesis H6:** There is a direct and positive relationship between perceived usefulness and intention to use.

In the information systems literature, the relationship between perceived usefulness and satisfaction has usually been studied as a part of ECT. Many studies have shown a significant influence from perceived usefulness towards satisfaction (Bhattacherjee 2001; Thong *et al.* 2006; Limayem *et al.* 2007; Hossain *et al.* 2009). However, not all of these studies were in the e-government context. Thus, the following hypothesis is proposed.

**Hypothesis H7:** There is a direct and positive relationship between perceived usefulness and satisfaction.

Based on Fishbein and Ajzen's (1975) theory of reasoned action, satisfaction indicates positive attitude, which will increase positive behavioural intentions. According to Oliver (1997) in the consumer satisfaction research, satisfied, rather than unsatisfied, customers are more likely to stay loyal to the product or service, such as making repeat purchases of the same product or service. Likewise, it is expected that satisfied IT users are more likely to continue their use of that technology (Thong *et al.* 2006; Zhao *et al.* 2012b; Alawneh *et al.* 2013; Reddick & Roy 2013). In the IS literature, the relationship between satisfaction and intention to use is usually studied as a part of ECT. In these studies, such as Bhattacherjee (2001); Meng *et al.* (2004); Thong *et al.* (2006); Limayem *et al.* (2007); Venkatesh and Goyal (2010), satisfaction always appears as a significant factor influencing the intention to use. Zhang *et al.* (2011) also proposed this relationship in their model, and they recommended further study. Therefore, the following hypothesis is proposed.

**Hypothesis H8:** There is a direct and positive relationship between satisfaction and intention to use.

Much of the IS use literature studies behaviour in general, especially those which use TAM to understand users' attitudes. However, these studies ignored an important part of human behaviour, which is habit. Habit and behaviour are not exactly the same (Limayem *et al.* 2007). Instead habit should be understood as a special type of mind-set that enhances the perceptual readiness for habit-related cues, and prevents an individual from being distracted and from adopting other, less efficient courses of action (Verplanken & Aarts 1999). Habit has found only little attention in the IS literature (Karahanna *et al.* 1999; Limayem & Hirt 2003; Limayem *et al.* 2007). The relationship between satisfaction and habit has been found to be significant (Limayem *et al.* 2007). Therefore, the following hypothesis is proposed.

**Hypothesis H9:** There is a direct and positive relationship between satisfaction and habit.

In the IS literature, there are many studies which have investigated the factors that influence the initial intention to use, but investigations of continuance use of IS has not been found yet (Carter & Belanger 2004; Phang *et al.* 2005; Wangpipatwong *et al.* 2008; Limayem 2011; Wells 2011; Sun 2012; Hung *et al.* 2013). There are some studies on the continuance use of IS showing a strong relationship between intention to use and continuance use (Bhattacherjee 2001; Meng *et al.* 2004; Thong *et al.* 2006; Limayem *et al.* 2007; Hossain *et al.* 2009; Deng *et al.* 2010). However, not all of these studies are in the context of e-government. Therefore, the following hypothesis is proposed.

**Hypothesis H10:** There is a direct and positive relationship between intention to use and e-government continuance.

As we discussed in literature on habit in chapter 3, prior researchers usually considered habit *as an independent variable* or a predictor of actual behaviour (Nilsen *et al.* 2012; Olsen *et al.* 2013; Polites & Karahanna 2013; Terzis *et al.* 2013). Habit and intention, separately or together, act as predictors of actual behaviour (Hong-wen *et al.* 1988). In contrast, Towler and Shepherd (1992) found that habit and intention, independently of each other, influenced actual behaviour. Finally, Saba *et al.* (2000) found that habit in the model was the most important predictor of the actual behaviour. These findings are consistent with the habit studies in the IS literature. "Habit has a direct effect on technology use" (Venkatesh *et al.* 2012, p. 158). Furthermore, while Trafimow (2000) analysed the relationship between habit and intention to behave as a proxy for actual behaviour, he concluded that future research should examine a direct effect of habit on actual behaviour.

In contrast, prior empirical research by Limayem *et al.* (2007) has treated habit as a moderating variable of the relationship between intention to use IS and IS continuance behaviour. However, their study uses the data from students using the WWW, which is a very general application that can be used for many different purposes. In consequence, the stable context of this study is not ensured. The authors concluded that, due to the as-yet largely unexplored differences between general habits (e.g., a habit to use the WWW) and specific habits (e.g., usage of a particular

e-mail application), it is conceivable that continued IS usage is affected differently, depending on the type of habit (general versus specific) in question (Limayem *et al.* 2007). Given the stable context requirement which was discussed in the literature review chapter, this study has decided to treat habit as an independent antecedent of continuance actual behaviour when using particular e-government services. This decision is consistent with both the psychological and IS research literatures. Despite the lack of studies using habit as a behavioural driver, not all of these studies are in the e-government context. Therefore, the following hypothesis is proposed.

**Hypothesis H11:** There is a direct and positive relationship between habit and e-government continuance.

Researchers in psychology have been demonstrating that cognitive models never capture all the antecedents of the user behaviour. The emotional side, and its relation to the IS use, has received less attention. Emotion can be defined as a mental state of readiness for action that promotes behavioural activation, and helps prioritize and organize behaviours in ways that optimize individual adjustments to the demands of the environment (Bagozzi *et al.* 1999). It is known that emotional control has a significant impact on our decisions, actions and attitudes. Many studies call for further investigation into the relationship between emotion and IS continuance use. Thus, studying emotion as an antecedent of e-government continuance, is very important to fully understanding user behaviour.

The direct and indirect effects of emotion on IS use has been studied in prior research (Rutner *et al.* 2008; Beaudry & Pinsonneault 2010; Park & Im 2012; Stein *et al.* 2012). These studies examined the direct and indirect relationships between emotions and IS use. These studies indicated that positive emotions, such as excitement and happiness, were positively and directly related to IT use, while negative emotions were related to IT use indirectly. This study has shown empirical evidence for emotion as a significant antecedent to IS use. In other research, Ortiz de Guinea and Markus (2009) explored a hybrid theory by studying mixing behaviour that is not consciously controlled, such as habit and the influences of emotion on the IS

continuing use. The authors of this study failed to conduct an empirical test for their theory. Thus, they called for empirical research that would directly compare and contrasts the consensus theory of continuing IT use, with rival theories that place much greater emphasis on unplanned and unreasoned action. Therefore, the following hypothesis is proposed.

**Hypothesis H12:** There is a direct and positive relationship between emotion and e-government continuance.

Table 4.2 shows a list of all the research hypotheses.

Table 4.2 Summary of the research hypotheses

| Hypotheses | Description |
|---|---|
| H1 | There is a direct and positive relationship between conformation and perceived usefulness. |
| H2 | There is a direct and positive relationship between conformation and satisfaction. |
| H3 | There is a direct and positive relationship between service quality and satisfaction. |
| H4 | There is a direct and positive relationship between service comprehensiveness and habit. |
| H5 | There is a direct and positive relationship between frequency of past behaviour and habit. |
| H6 | There is a direct and positive relationship between perceived usefulness and intention to use. |
| H7 | There is a direct and positive relationship between perceived usefulness and satisfaction. |
| H8 | There is a direct and positive relationship between satisfaction and intention to use. |
| H9 | There is a direct and positive relationship between satisfaction and habit. |
| H10 | There is a direct and positive relationship between intention to use and e-government continuance. |
| H11 | There is a direct and positive relationship between habit and e-government continuance. |
| H12 | There is a direct and positive relationship between emotion and e-government continuance. |

## 4.5 Summary

This chapter presented the research questions, introduced the proposed research model and related hypotheses. It also introduced and provided the justification for each of the hypotheses associated with the model. The next chapter, Research

Methodology, will describe the research methodology and the design used to address the research questions.

# CHAPTER 5: RESEARCH METHODOLOGY

## 5.1 Introduction

This chapter aims to present the research methodology and the design used to address the research questions raised in the previous chapter. Choosing the right methodological approach, and selecting the suitable research design, will be critically important to addressing the research problem (Avison & Pries-Heje 2005). The research design involves a series of rational decision-making choices, such as the type of sample to be used, how the data will be collected and how the variables will be measured (Cavana *et al.* 2001). In this research, the problem is addressed in a model-driven empirical study which uses online survey methodology. The model of this study is based on IS studies and others, but it will be empirically tested in the field of e-government. All parts of this model are presented in the literature review chapter. A quantitative methodology will be used in this research, in order to be able to answer the research questions and better understand the research phenomenon.

## 5.2 Survey participants

Survey participants were drawn from the population of 8,157 Saudi students studying in Australia. In this thesis the participants are referred to citizens because they are citizens of Saudi Arabia, many of whom have taken leave from their full-time work in Saudi Arabia to study in Australia. In e-government research literature, a number of prior published studies use the term "citizens" (e.g., Aladwani (2013) ; Alawneh *et al.* (2013) and Hung *et al.* (2013)). The target population for this research is the Saudi citizens who have an experience with e-government services. This means that the target population needs to possess some minimal level of literacy and computer efficiency required to access and navigate the Internet. Therefore, we consider Saudi student populations as most suitable for this research. More specifically, the research sample was drawn from the entire population of Saudi students – both undergraduate and postgraduate students – who are studying in Australia. The Australian site was strategically chosen because I have access to the Saudi Students Club network and the Saudi government organizations in Canberra.

Although the sample comprises Saudi students, they are fair representatives of Saudi young citizens, because many of them are government employees from all agencies of the Saudi government, some are private-sector employees, while some of those students are unemployed citizens. Saudi students in Australia are studying in all education levels: undergraduate, postgraduate, specific courses (e.g. military courses), and English language courses. In general, the education level in Saudi Arabia is very high. Based on a UNICEF (2010) report, the literacy rate is 99% and 97% among males and females respectively. Those students vary in age and experience in using information technology. Thus, I believe that the research sample is a fair representation of the general Saudi citizen population. The sample of Saudi students are distributed widely across Australia.

## 5.3 Survey

### 5.3.1 Survey strategy

A survey was chosen as one of the research strategies to reduce possible practitioner bias and to provide an objective benchmark for this research (Cavana *et al.* 2001). Choosing the right survey strategy is an important step in designing a survey instrument because it will affect how the data will be collected (Cavana *et al.* 2001). Gathering data can be done in many ways. For example, data can be gathered using mailed surveys, face to face surveys or online surveys. However, none of these methods is superior in all types of researches. Each method has different characteristics which can suit particular types of researches. In addition, choosing the wrong survey methods can end up with the research questions not being answered. In the case of this research, all of the population of Saudi students studying in Australia have email addresses and are connected to the Internet. Moreover, they are distributed widely in the large land areas of Australia. Thus, an online survey has been chosen as the best strategy for this research.

### 5.3.2 Survey design and development

This section describes how the survey instrument was developed to answer the research questions. Survey design should be directed by taking into consideration the objectives of the research. Careful consideration is given to a number of aspects

including the types of questions to be asked, the survey wording, the structure and design of the survey, and testing the survey to ensure that quality data is collected.

This research is based on a research model. This model contains a number of constructs. A construct is a concept or idea; examples of psychological constructs include intelligence, depression, aggression, and memory (Shaughnessy *et al.* 2012). One way in which a researcher gives meaning to a construct is by defining it operationally (Shaughnessy *et al.* 2012). The process of operationalization is critical for effective research. Operationalization is translating a very general research aim or purpose into specific, concrete questions to which specific, concrete answers can be given (Cohen *et al.* 2005). The process moves from the general to the particular, from the abstract to the concrete. Hence the researcher breaks down each general research purpose or general aim into more specific research purposes and constituent elements, continuing the process until specific, concrete questions have been reached to which specific answers can be provided (Cohen *et al.* 2005). An operational definition explains a concept solely in terms of the observable procedures used to produce and measure it (Shaughnessy *et al.* 2012).

In order to develop a measurement, each construct inside the research model will be conceptualised then operationalised. The existing literature related to any construct is never ignored. In fact, most of the construct measures developed are based on the related literature in the field of information systems. However, some constructs, such as e-government continuance, do not have a validated measurement in the literature of information systems. Thus, some of its questions are brought from the marketing literature and some of the instrument questions were exploratory. In addition, it is worth mentioning that all the used measurements are from highly ranked and validated literature.

Constructs were operationalised using validated items from prior related researches. All the constructs measures and their source researches are presented in Table 5.1.

Table 5.1 The constructs measures, their source and subject field

| Constructs | Sources | Subject field |
|---|---|---|

| | | |
|---|---|---|
| Satisfaction | (Bhattacherjee 2001) | Information Systems |
| Habit | (Limayem *et al.* 2007) | Information Systems |
| Intention | (Bhattacherjee 2001) and (Limayem *et al.* 2007) | Information Systems |
| Perceived Usefulness | (Davis 1989) | Information Systems |
| Service Comprehensiveness | (Limayem *et al.* 2007) | Information Systems |
| Frequency of Past Behaviour | (Limayem *et al.* 2007) | Information Systems |
| Confirmation | (Bhattacherjee 2001) and (Oliver 1980) | Information Systems and marketing |
| E-government Continuance | (Limayem *et al.* 2007) and (Chaudhuri & Holbrook 2001) | Information Systems and marketing |
| Service Quality | (Wangpipatwong *et al.* 2005) | E-government |

### 5.3.3 Measurement scale development

The Likert scale is the most commonly used scale in information systems (Bhattacherjee 2012). The Likert scale is designed to examine how strongly subjects agree or disagree with statements on a five or seven points scale (Cavana *et al.* 2001). In this research, the seven Likert scale will be used. This will provide a more accurate measure of a participant's true evaluation (Finstad 2010) and having seven points tends to be a good balance between having enough points of discrimination, without having to maintain too many response options (Sauro 2010). Figure 5.1 shows the seven points Likert scale. The participants will be asked to rate each statement from strongly disagree to strongly agree.

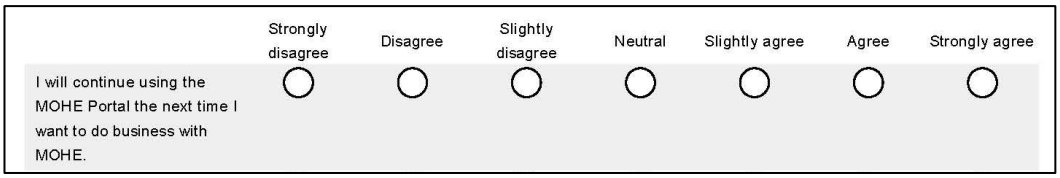


Figure 5.1 The seven Likert scale

### 5.3.4 Preparing the instrument

The first part of the survey aims to collect demographic and background information about the online survey participants. It consists of 6 items as shown in Table 5.2. Age

is measured on a five category scale (20-24, 25-29, 30-34, 35-39, 40 and above). The level of education item is measuring the last completed education degree. The level of education is categorized in 5 educational levels (high school, diploma, bachelor's degree, master's degree, doctoral degree). The primary use of the Internet is a multiple answer item. The participants can choose as many as they want from seven answers presented in a menu bar, including information searching, browsing and/or surfing, shopping, e-mail, social media or social networking, reading online news/magazines, and financial services/online banking. In addition, there is an item to measure the frequency of Internet use. Also, there is an item to collect the staying period in Australia. This item is categorized in seven scales: less than 1 year, 1 year, 2 years, 3 years, 4 years, 5 years, more than 5 years. (See appendix C)

Table 5.2 Background and demograhpic items

| **Item** |
|---|
| Gender (sex) |
| How old are you? |
| What is your last completed education degree? |
| What are your primary uses of the Internet? |
| How often do you use the Internet? |
| How long have you been studying in Australia? |

The second scale of the survey questionnaire aims to obtain e-government use experience. This scale consists of 6 items as shown in Table 5.3. The first item is asking about the preferred way to access government services. The second item is asking about the preferred way the participant used if the participant had faced any problem with government e-services. The answer for both items consisted of using the MOHE portal, email, mail, and face to face. The e-services inside the MOHE portal are organized into four categories: "My Information Services", "Personal Services", "Financial Services", and "Academic Services". There are many e-services under each one of these categories. In the survey, all the e-services under its category were listed and the participants were asked what were the most used e-services under each category.

Table 5.3 E-government use experience

| **Item** |
|---|
| I prefer the following way if I need a government service. |
| If I face a problem with any government e-service, I choose to use the following |

| |
|---|
| method.<br>Which of "My Information Services" did you use the most?<br>Which of "Personal Services" did you use the most?<br>Which of "Financial Services" did you use the most?<br>Which of "Academic Services" did you use the most? |

The third part of the survey provides the items of each construct inside the research model. These constructs and their items are as following:

#### 5.3.4.1 Confirmation

Confirmation is measured using a seven points Likert scale, labelled from "strongly disagree" to "strongly agree". There are three items used to measure confirmation and they are from Bhattacherjee (2001). The items are slightly modified to suit the e-government domain. All confirmation items are listed in Table 5.4. (See appendix C)

Table 5.4 Confirmation scale items

| **Code** | **Item** |
|---|---|
| Confirmation1 | My experience with using the MOHE Portal was better than what I expected. |
| Confirmation2 | The service level provided by the MOHE Portal was better than what I expected. |
| Confirmation3 | Overall, most of my expectations from using the MOHE Portal were confirmed. |

#### 5.3.4.2 Service quality

Service quality is measured using a seven points Likert scale, labelled from "strongly disagree" to "strongly agree". Four items are used to measure service quality. These items are from Wangpipatwong *et al.* (2005). The items are slightly modified to suit the e-government domain. All service quality items are listed in Table 5.5. (See appendix C)

Table 5.5 Service quality scale items

| **Code** | **Item** |
|---|---|
| SQ1 | Information on the MOHE Portal is accurate. |
| SQ2 | Information on the MOHE Portal is up-to-date. |
| SQ3 | The MOHE Portal always works properly without service disruption or downtime. |

| | |
|---|---|
| SQ4 | The MOHE Portal enables me to complete all necessary transactions online. |

#### 5.3.4.3 Service comprehensiveness

Service comprehensiveness is measured using a seven points Likert scale labelled from "strongly disagree" to "strongly agree". Two items are used to measure service comprehensiveness. These items are developed for this study based on Limayem *et al.* (2007). All service comprehensiveness items are listed in Table 5.6. (See appendix C)

Table 5.6 Service comprehensiveness scale items

| Code | Item |
|---|---|
| SC1 | I find all the services that I need in the MOHE Portal. |
| SC2 | The MOHE Portal provides all required services for Saudi students |

#### 5.3.4.4 Frequency of past behaviour

Frequency of past behaviour items are used to measure frequency of past behaviour. These items are from Limayem *et al.* (2007). The items are slightly modified to suit the e-government domain. All frequency of past behaviour items are listed in Table 5.7. (See appendix C)

Table 5.7 Frequency of past behaviour scale items

| Code | Item |
|---|---|
| FPB1 | In the last 3 months, how often did you access the Ministry of Higher Education (MOHE) Portal? |
| FPB2 | Approximately, how many times did you on average visit the MOHE Portal in the last 3 months? |

#### 5.3.4.5 Perceived usefulness

Perceived usefulness is measured using a seven points Likert scale labelled from "strongly disagree" to "strongly agree". Five items are used to measure perceived usefulness. These items are from Davis (1989). The items are slightly modified to suit the e-government domain. All perceived usefulness items are listed in Table 5.8. (See appendix C)

Table 5.8 Perceived usefulness scale items

| Code | Item |
|---|---|
| PU1 | Using MOHE Portal would enable me to complete tasks more efficiently. |
| PU2 | Using MOHE Portal would increase my productivity on the tasks. |
| PU3 | Using MOHE Portal would enhance my effectiveness on the tasks. |
| PU4 | Using the MOHE Portal would make it easier to do tasks. |

#### 5.3.4.6 Satisfaction

Satisfaction is measured using a seven points Likert scale labelled from "strongly disagree" to "strongly agree". Three items are used to measure satisfaction. These items are from Bhattacherjee (2001); Bhattacherjee and Premkumar (2004); Thong *et al.* (2006). The items are slightly modified to suit the e-government domain. All satisfaction items are listed in Table 5.9. (See appendix C)

Table 5.9 Satisfaction scale items

| Code | Item |
|---|---|
| Satisfaction1 | I am pleased with the overall use of the MOHE Portal. |
| Satisfaction2 | I feel satisfied about my overall experience of using the MOHE Portal. |
| Satisfaction3 | Overall, I am satisfied with Saudi e-government services which include other government Portals besides the MOHE Portal. |

#### 5.3.4.7 Habit

Habit is measured using a seven points Likert scale, labelled from "strongly disagree" to "strongly agree". Three items are used to measure habit. These items are from Limayem *et al.* (2007). The items are slightly modified to suit the e-government domain. All habit items are listed in Table 5.10. (See appendix C)

Table 5.10 Habit scale items

| Code | Item |
|---|---|
| Habit1 | Using MOHE Portal has become automatic to me. |
| Habit2 | Using the MOHE Portal is natural to me. |
| Habit3 | When I have an inquiry, the MOHE Portal is an obvious choice for me. |

#### 5.3.4.8 Intention to use

Intention to use is measured using a seven points Likert scale labelled from "strongly disagree" to "strongly agree". Three items are used to measure intention to use. These items are from Bhattacherjee (2001). The items are slightly modified to suit the e-government domain. All the items are listed in Table 5.11. (See appendix C)

Table 5.11 Intention to use scale items

| Code | Item |
|---|---|
| ITU1 | I intend to use the MOHE Portal rather than using any alternative way. |
| ITU2 | I intend to use the MOHE Portal rather than discontinue its use. |
| ITU3 | Overall, I plan to use the MOHE Portal. |

#### 5.3.4.9 E-government continuance

E-government continuance is measured using a seven points Likert scale labelled from "strongly disagree" to "strongly agree". Four items are used to measure e-government continuance. These items are developed for this study based on Deng *et al.* (2010). All e-government continuance items are listed in Table 5.12. (See appendix C)

Table 5.12 E-government continuance scale items

| Code | Item |
|---|---|
| EGC1 | I will continue using the MOHE Portal the next time I want to do business with MOHE. |
| EGC2 | I intend to keep using the MOHE Portal. |
| EGC3 | Being able to continuously use MOHE Portal is very important to me. |
| EGC4 | I am committed to keep using MOHE Portal. |

#### 5.3.4.10 Emotion

Emotion is measured using a seven points Likert scale labelled from "strongly disagree" to "strongly agree". Five items are used to measure Emotion. These items are developed for this study based on Beaudry and Pinsonneault (2010). All emotion items are listed in Table 5.13. (See appendix C)

Table 5.13 Emotion scale items

| Code | Item |
|---|---|
| Emotion1 | I am happy whenever I use the MOHE Portal. |
| Emotion2 | Using the MOHE Portal gives me pleasure. |
| Emotion3 | When I think that I am going to use the MOHE Portal I feel angry. |
| Emotion4 | The idea of using the MOHE Portal makes me feel depressed. |
| Emotion5 | I feel frustrated when I am going to use the MOHE Portal. |

### 5.3.5 Pilot validity and reliability of the survey instrument

If something is valid, it is "true" in the sense that it is supported by available evidence (Cozby & Bates 2012). Obviously a measure should be both reliable and valid (Jackson 2011). Validity is an important key to effective research (Cohen *et al.* 2005). Validity refers to the truthfulness of a measure: Does it measure what it intends to measure? Validity also refers to the extent to which a measure adequately represents the underlying construct that it is supposed to measure (Bhattacherjee 2012).

In this research the basic types of validity that have been used are face validity and construct validity. Face validity indicates that the items being presented on the survey are clear and understandable to the subjects (Cavana *et al.* 2001). Face validity is usually tested by giving the survey to a sample of respondents, to gauge their reaction to the items to simply address whether or not a test looks valid on its surface (Cavana *et al.* 2001; Jackson 2011). As a result, the survey instrument was pre-tested with an academic who is considered as an expert in the information systems (IS) and e-government fields. Also, a group of postgraduate research students in the field of information systems were used to pre-test the instrument. Upon completing the survey, the pilot study participants were interviewed individually by this author about any difficulties in understanding the questions and possible suggestions for improvement. Based on their feedback, revisions and improvements were made for better wording of some scale items. Then the academic provided further feedback on the revised survey instrument, to ensure the clarity of the items and the overall usability of the survey instrument.

Construct validity is considered by many to be the most important type of validity (Jackson 2011). Construct validity represents the extent to which a measure assesses the theoretical construct it is designed to assess; construct validity is determined by assessing discriminate validity (Shaughnessy *et al.* 2012). In this research, uni-dimensionality of scale was evaluated through exploratory factor analysis and testing the correlation co-efficient. Exploratory factor analysis using principal component was used. IBM SPSS 20 was used to conduct the factor analysis. Scale items will be analysed one by one.

Reliability of measurement refers to whether an instrument can be interpreted consistently across different situations (Field 2009). In this research, each constructs' items were cleaned up by analysing them and evaluating their reliability tests. The reliability test will be conducted in the pilot study of the research to assess the internal consistency of the measurement. Cronbach's alpha was used to estimate the internal consistency of each group of items for every construct. In this research, the reliability function of IBM SPSS20 was used to calculate Cronbach's alpha. Cronbach's alpha is an indicator of internal consistency reliability, assessed by examining the average correlation of each item (question) in a measure with every other question (Cozby & Bates 2012). Scholars suggested 0.7 as an accepted value (Field 2009; Stafford & Turan 2011). As a result, some items were removed to increase the alpha co-efficient.

### 5.3.6 Instrument translation into Arabic

Choosing the right questionnaire language is very important. That is because the participants will be asked to give their opinion and what they think and in order to achieve this, the questionnaire language should be fully understood by the participants (Oppenheim 2000). Oppenheim also raised the importance of matching between the participants' educational level and the use of scientific terms or idioms in the questionnaire. In other words, all the terms inside the questionnaire should be fully understandable by the participants. In addition, Cavana *et al.* (2001) also claims that choosing the questionnaire words would depend on the participants' educational level, the usage of terms and idioms in the culture and the frames of reference of the respondents. For instance, even in one language, but in two cultures, some particular

words will be understood differently by the two groups of cultures. If some questions either are not understood or are interpreted differently by the respondents, the researcher will be obtaining the wrong answer to the questions and responses will as a consequence be biased (Cavana *et al.* 2001).

Because of all of the Saudi students are using the Arabic language to communicate, all questionnaire items will be translated into the Arabic language, with the availability of the English version of the questionnaire. In order to ensure the translation quality, the translation process took two steps. The first step is to translate the English version of the questionnaire translated into Arabic language by two trusted independent translators. This procedure produced two versions of the Arabic questionnaire. Then the two versions of the Arabic translation are compared together in order to investigate the use of different terms and words. Then the two Arabic versions are combined together in one version, based on the right use of Arabic terms and words. The second step is to translate back the Arabic version to the English version to ensure the accuracy of the translation. The translation of this step is also completed by a trusted translator. Then the two versions of the questionnaire in both languages are compared to resolve any differences.

### 5.3.7 Ethical consideration

All researchers who are conducting research or exposing research findings have to satisfy a number of obligations, in order to meet the ethical specifications and standard provided by the researcher's institute or the federal government. The research must be conducted based on ethical practices to be ethically accepted. For example, the researcher must ensure the participants' confidentiality, and the participant response will not be divulged to anyone in the organization (Cavana *et al.* 2001). Participants' dignity and welfare must be protected and ensured, as well as those who may be affected by the findings of the research. While participants are encouraged to respond to the research, they must be not pressured to do so in anyway and their confidentiality must be assured.

In Australia, the National Statement on Ethical Conduct in Human Research (2007) sets national standards for use by any individual, institution or organisation

conducting human research. These national standards include human research undertaken by governments, industry, private individuals, organisations, or networks of organisations. In addition, Australian institutions are responsible for establishing procedures for the ethical review of human research. That review can be undertaken at various levels, according to the degree of risk involved in the research (National Statement on Ethical Conduct in Human Research 2007). Thus, all public institutions, such as universities and government departments, that involve human participants, are required to get an approval from accredited Human Research Ethics Committees (HREC). These committees must consider whether the research proposals obey the national and state legislation, regarding the handling of personal information or any information which may identify an individual. HREC is the usual legal requirement for obtaining access to information.

HREC at the University of Wollongong provides ethics guidelines to address the ethical issues rising from the study. "The purpose of HRECs is to protect the welfare and rights of the participants in the research" (University of Wollongong 2011). This research will strictly follow all the ethics guidelines provided by Human Research Ethics Committee (HREC) at the University of Wollongong (UOW). A human ethics application with all the required documents including 'HREC Form', 'Consent Form', 'Participation Information sheet' and the survey instrument were submitted to the UOW Human Research Ethics Committee before commencing this research. After reviewing the application, the HREC raised some privacy concerns regarding the distribution method of the survey. Based on HREC comments, the researcher addressed HREC concerns and modified the method of distributing the survey to the participants. After that, HREC reviewed the researcher's solutions for their concerns. HREC gave its approval to this research with the approval number HE11/390 (see appendix D)

It is worth mentioning that the researcher provided the HREC with comprehensive information about this research, including the purpose of this research, the research methodology, the protection of confidentiality and privacy of participants, storage access, disposal of data and other ethical issues that arose.

In addition, all participants in this research clearly consented to be involved in this research by completing a Consent Form, allowing the participants practice their right of agreeing or disagreeing to participate in the research. This Consent Form was provided to all participants and was read by the participants before starting the survey.

### 5.3.8 Pretesting the instrument (Pilot study)

Shaughnessy *et al.* (2012) indicate that the most critical step in the development of an effective questionnaire is to do a pre-test. A pre-test involves actually administering the questionnaire to a small sample of respondents, under conditions similar to those anticipated in the final administration of the survey (Shaughnessy *et al.* 2012).

A pilot test, or pre-test, should be conducted in at least one site to try out all instruments and procedures, to help identify revisions or corrections that are needed (Wholey *et al.* 2004). Despite all the procedures that most researchers follow to avoid questionnaire's mistakes before they publish the questionnaires, mistakes do occasionally still get through. "It is often the small mistakes that go unnoticed, but these may have a dramatic effect on the meaning of a question or on the routing between questions" (Brace 2008). Running a pilot survey before starting the whole survey is the only way to identify problems and improve the questionnaire design (Waters 2011).

So it is always advisable to conduct a 'pilot study' (pilot survey) for testing the questionnaire (Kothari 2008). Pre-test (pilot study) respondents must also be typical of those to be included in the final sample; it makes little sense to pre-test a survey of nursing home residents by administering the questionnaire to college students (Shaughnessy *et al.* 2012). Thus, the pre-test (pilot study) respondents of this research were typical of those to be included in the final sample. The final sample of this research is Saudi students who are studying in Australia. Accordingly, the pre-test (pilot study) respondents were 40 Saudi students who were studying in Australia.

“Piloting the questionnaire” means to give it a test run, to see if it is obtaining the results required (Dawson 2002). Conducting a pilot survey will bring to light any weaknesses in the questionnaire and the survey techniques (Kothari 2008). A pilot has several functions, principally to increase the reliability, validity and practicability of the questionnaire (Cohen *et al.* 2005). The pilot study will reveal whether participants understand the instructions, whether the total experimental setting seems plausible, whether any confusing questions are being asked, and so on (Cozby & Bates 2012).

So, conducting a pilot study is valuable for this research in terms of increasing the instrument accuracy. It also gives an advance warning to the researcher before going on to big scale survey distribution.

#### 5.3.8.1 Pilot study sample

The right sample size is always a question that is often hard to answer for researchers. That is because there is no clear-cut answer, for the correct sample size depends on the purpose of the study and the nature of the population under scrutiny (Cohen *et al.* 2005). However, a pilot study size of 12-30 is recommended (Hunt *et al.* 1982). Therefore, a random 40 Saudi students were selected to perform the pilot study. A total of 30 surveys were returned with a 75% response rate. Ten incomplete surveys were rejected.

#### 5.3.8.2 Demographic analysis of the pilot study

As Table 5.14 shows, 23 of the respondents (76.7%) were male and 7 of the respondents (23.3%) were female. Most of the respondents were studying a master’s degree with a percentage of 40%, in contrast with only 13% studying a diploma. In addition, 12 respondents (40%) were staying in Australia for 3 years, in contrast with only 3 respondents (10%) staying in Australia for 5 years. Almost all of the respondents use the Internet for information searching, browsing and surfing, shopping, e-mail, social media/social networking, reading online news/magazines, and financial services/online banking. These results indicate that most of the students have considerable experience in using the Internet.

Table 5.14 Pilot study demographic data.

| Variable | Valid | Frequency | Percent |
|---|---|---|---|
| Gender | Male | 23 | 76.7 |
| | Female | 7 | 23.3 |
| Age | 20-24 | 9 | 30.0 |
| | 25-29 | 14 | 46.7 |
| | 30-34 | 3 | 10.0 |
| | 35-39 | 3 | 10.0 |
| | 40 and above | 1 | 3.3 |
| Education | Diploma | 4 | 13 |
| | Bachelor's degree | 6 | 20 |
| | Master's degree | 12 | 40 |
| | Doctoral degree | 8 | 27 |
| Staying in Australia Duration | 2 years | 7 | 23.3 |
| | 3 years | 12 | 40.0 |
| | 4 years | 4 | 13.3 |
| | 5 years | 3 | 10.0 |
| | More than 5 years | 4 | 13.3 |
| Internet Usage | Once a month | 3 | 10.0 |
| | A few times a week | 1 | 3.3 |
| | Once a day | 1 | 3.3 |
| | A few times a day | 25 | 83.3 |

#### 5.3.8.3 Pilot study reliability results

The reliability of a measurement is indicated by its consistency (Shaughnessy *et al.* 2012). Reliability refers to the consistency of measurement and is frequently assessed using the test–retest reliability method. Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals, and by using uniform testing procedures (Shaughnessy et al. 2012). The measurement was assessed. Any items that showed a low value of reliability were removed. A commonly used indicator of reliability based on internal consistency, called Cronbach's alpha, provided the average of all possible split-half reliability coefficients (Cozby & Bates 2012). Field (2009) suggested the acceptable value for Cronbach's alpha for a reliable scale between .7 and .8. Cronbach's alpha was used to assess the reliability of the instrument items. Table 5.15 shows the value of Cronbach's alpha for all the instrument items.

Table 5.15 Pilot test of reliability coefficients of the scale items (Cronbach's Alpha)

| Construct | Cronbach's Alpha Stage 1 | N. of Items | Cronbach's alpha Stage 2 | N. of Items |
|---|---|---|---|---|
| E-Government Continuance | 0.779 | 4 | 0.779 | 4 |
| Intention to Use | 0.733 | 3 | 0.733 | 3 |
| Emotion | 0.55 | 5 | 0.715 | 4 |
| Confirmation | 0.912 | 3 | 0.912 | 3 |
| Satisfaction | 0.888 | 3 | 0.888 | 3 |
| Habit | 0.835 | 3 | 0.835 | 3 |
| Frequency of Past Behaviour | 0.709 | 2 | 0.709 | 2 |
| Perceived Usefulness | 0.639 | 5 | 0.738 | 4 |
| Service Comprehensiveness | 0.771 | 3 | 0.771 | 3 |
| Service Quality | 0.839 | 4 | 0.839 | 4 |
| Total | | 35 | | 33 |

## 5.4 Survey administration and data collection

As mentioned in the survey strategy section, the online survey method was chosen because of the nature of the participants and the availability of the Internet. Thus, an online survey service provider was chosen in order to put the survey instrument in online server 24 hours / 7 days a week. The online survey link was open for 5 months. The online server saved the IP address of each participant for the whole 5 months in order to not let any participants answer the survey more than once. The distribution of this survey was accomplished through sending the survey online link to the participants. The survey link was sent to all of the research population.

According to Australian Education International (2012), there were 8,175 Saudi students studying in Australia in April 2012. Every group of Saudi students studying in the same city or town has a membership of the Saudi club of that city or town. Each one of these clubs has a club president who is elected from the club members. One of the club presidents' duties is to communicate with the club members through the members' preferred contact method such as email, SMS and Twitter. The survey online link was distributed to the clubs' members based on previous arrangement with the researcher. Then all the club presidents distributed the survey online link to all their members. This method ensured that all the research population was reached and had the opportunity to participate in this study.

These distributed links are all connected to a commercial survey service provider. In fact, every completed survey was stored automatically in the web servers of this provider. The researcher can monitor the progress in completing the survey in real time. At the end of 5 months of distributing the survey link, the researcher downloaded the survey data in two formats (SPSS format and Excel format) to start analysing the data.

## 5.5 Data editing

After data had been obtained through the survey, it was edited to make the data ready for analysis (Cavana *et al.* 2001). Data editing or (data cleaning) includes looking inside the data, seeking any blank responses manually, because data preparation techniques cannot be completely automatic (Pyle 1999; Cavana *et al.* 2001). In addition, data editing includes handling the responses with missing items. It is important to check carefully for errors such as missing or impossible values e.g., numbers outside the range of a given scale (Shaughnessy *et al.* 2012). It is recommended to throw out the questionnaires that have 25% of the items left without an answer (Cavana *et al.* 2001). This research followed the previous strategy of deleting any questionnaires that had 25% or more items left unanswered. All empty questionnaires were deleted.

## 5.6 Data analysis

In this section the data analysis steps are presented. After collecting the survey data, the first step was to present the descriptive statistics (see chapter 6). This step includes two parts. The first part was to illustrate the demographic statistics in order to have some demographical background of the survey respondents. The second part of the descriptive statistics was to illustrate some general information about MOHE portal e-services. By doing this, a comprehensive view of both demographic and MOHE portal background information was obtained.

The second step was to assess the reliability and validity of the instrument. The reliability was assessed using the reliability function in SPSS20. In particular,

Cronbach's Alpha for each construct item was calculated. In this research, validity and unidimensionality of the scale was assessed using exploratory factor analysis and examination of the correlation co-efficient. Moreover, convergent and discriminant validity of the measurement scale was also assessed with confirmatory factor analysis. Discriminant validity measures whether factors are statistically different from each other or not (Al-Debei *et al.* 2012). The AVE of each variable should be greater than the squared correlation between a pair of latent variables. Convergent validity measures items' effectiveness in reflecting their corresponding factor (Al-Debei *et al.* 2012).

After that, the overall model was tested using Structural Equation Modelling (SEM). According to Hung *et al.* (2013) there are two reasons for using SEM. First, to provide a straight forward method for dealing with multiple relationships simultaneously, while providing statistical efficiency. Second, to assess relationships comprehensively, while providing a transition from exploratory to confirmatory analysis. The reason for using the SEM approach is to better view the whole research model, rather than a multiple regression approach alone (Liaw & Huang 2013). SEM software IBM AMOS21 was used. AMOS provides an easy implementation of well-known modification strategies, that provides a ranking of best fitting models and specifications for multiple regression, path, factor, and structural equation models (Schumacker 2006). "AMOS can be unbeatable as a workhorse for larger models and batch-oriented estimation results" (Arbuckle & Wothke 1999, p. 35). AMOS has the capability to deal with any model easily (Byrne 2001). Also it is recommended by academic statisticians for its accuracy when the data is normal and the sample size is more than 125. After that, the model was tested to ensure its fit with the data. Then all paths in the model were tested using SEM. Finally, an exploratory analysis of the model was conducted to investigate whether there were any new relationships between the model constructs that did not exist in the literature.

## 5.7 Summary

This chapter described the methodology used in this research. This research was conducted using a quantitative method which was carried out through an online survey. The chapter explained the reasons for selecting this method and provided details of how the participants were selected. The chapter also explained how the survey questions were designed and developed. It also explained all the pre-testing of the instrument steps and results, and how the data were collected and the variables measured. The chapter also discussed the consequences of the ethical considerations.

# CHAPTER 6: RESULTS

## 6.1 Introduction

The previous chapter described the survey questionnaire instrument which collected quantitative data to test the research model developed in this doctoral research. This chapter reports the hypothesis testing results. This chapter starts with the results of descriptive analysis on the survey participant demographics, and other factors that may affect the participants' actual use of e-government services.

## 6.2 Descriptive analysis

Questionnaires were distributed to all the study populations who were Saudi students studying in Australia. The survey was distributed online to 8,175 participants through the Survey Monkey website, whose URL was embedded in e-mails sent, calling for their survey participation. A total of 846 were completed and returned, giving the response rate of 10.3%. Only 759 were found to be usable, with 87 questionnaires being excluded from the analysis because of their high rate of missing data.

### 6.2.1 Demographic analysis of the sample

One important factor that affects the use of e-government services is the society's level of ICT knowledge and efficacy. This use tends to be affected by demographic and socio-economic factors.

The following Table 6.1 provides a general overview of the demographic characteristics of the respondents.

Table 6.1 Demographic statistics

| Variable | | Frequency | Percent |
|---|---|---|---|
| Gender | Male | 625 | 82.3 |
| | Female | 134 | 17.7 |
| Age | 20-24 | 199 | 26.2 |
| | 25-29 | 292 | 38.5 |
| | 30-34 | 183 | 24.1 |
| | 35-39 | 63 | 8.3 |
| | 40 and above | 22 | 2.9 |

| | | | |
|---|---|---|---|
| Education | Master's degree | 292 | 38.5 |
| | Bachelor's degree | 280 | 36.9 |
| | Diploma | 88 | 11.6 |
| | High school | 64 | 8.4 |
| | Doctoral degree | 35 | 4.6 |
| Studying in Australia | Less than 1 year | 60 | 7.9 |
| | 1 year | 65 | 8.6 |
| | 2 years | 141 | 18.6 |
| | 3 years | 307 | 40.4 |
| | 4 years | 115 | 15.2 |
| | 5 years | 38 | 5.0 |
| | More than 5 years | 33 | 4.3 |
| Internet use frequency | A few times a day | 723 | 95.3 |
| | Once a day | 19 | 2.5 |
| | A few times a week | 16 | 2.1 |
| | Once a month | 1 | .1 |

**Gender**

Table 6.1 shows that 625 (82.3%) of the respondents are male and 134 (17.7%) are female. This distribution of male and female is fairly representative of the population of overseas Saudi students, with an overwhelming number being male.

**Age**

The average age of Saudi citizens is 26 years (CIA Factbook 2012). Age was categorized in the interval of five years. As shown in Table 6.1 above, the highest age group, 25-29 years old, included 292 respondents (38.5%), followed by 20-24 years old with 26.2%. Then 24.1% of the respondents were 30-34, followed by 35-39 with 8.3%. The lowest age range was the respondents who were 40 and above, with only 2.9%.

**Education**

The level of education was measured by the last completed education degree. As Table 6.1 shows, the majority of respondents were from the master's degree level with 38.5%, followed by bachelor's degree level with 36.9%. 11.6% of the respondents were from diploma level, and 8.4% were from high school level. The lowest number of respondents were in the doctoral degree level.

**Staying in Australia**

As Table 6.1 shows, the majority of the respondents were studying in Australia for three years, with 40.4%. 18.6% of the respondents were studying in Australia for two years, followed by respondents who were studying in Australia for four years with 15.2%. Only 8.6% of the respondents were studying in Australia for one year, followed by 7.9% studying in Australia for less than one year. The lowest rate was 5% for those studying in Australia for five years, and 4.3% for those studying for more than 5 years.

**Internet use frequency**

Table 6.1 shows that the highest Internet use frequency, which is "a few times a day", was 95.3%. This percentage shows clearly that those respondents have the required experience to use the Internet.

**The primary use of the Internet**

The primary use of Internet was a multi-answer question. Therefore, the respondents chose as many answers as they wanted. Table 6.2 shows that information searching and e-mail were the highest use of the Internet with 96% and 95.1%. "Browsing and/or surfing" was 88.4%. "Financial services/online banking" was 84.6%. "Reading online news/magazines" was 76.4%. "Social media or social networking" was 75.4%. Shopping was 70.1%.

Table 6.2 The primary use of Internet

| Primary use of the Internet | Frequency | Percent |
|---|---|---|
| Information searching | 729 | 96.0 |
| Email | 722 | 95.1 |
| Browsing and/or surfing | 671 | 88.4 |
| Financial services/online banking | 642 | 84.6 |
| Reading online news/magazines | 580 | 76.4 |
| Social media or social networking | 572 | 75.4 |
| Shopping | 532 | 70.1 |

**The preferred method for accessing government services**

As this study attempts to understand continuance use of e-government, it is essential to find the participants' preferred way or method for access among government

services. Table 6.3 shows that 51.1% of the respondents prefer using the MOHE Portal, with another 23.1% prefer to use e-mail for accessing government services. Only 18.8% of the respondents prefer using mail, which is followed by only 4.2% of the participants who prefer the face-to-face method for government services. The lowest percentage was 2.8% for respondents who prefer using the telephone for government services.

Table 6.3 The preferred method for accessing government services

| Government services methods | Frequency | Percent |
|---|---|---|
| Using the Portal | 388 | 51.1 |
| Email | 175 | 23.1 |
| Mail | 143 | 18.8 |
| Face to face | 32 | 4.2 |
| Phone call | 21 | 2.8 |

However, using the MOHE portal is not always free from problems. Sometimes the portal users face problems and they need some help from the government agency. Thus, Table 6.4 shows the preferred method if the respondents faced any problem with the portal. Despite the availability of technical assistance within the MOHE portal, only 6.6% of the respondents would use this feature and 48.7% would use the e-mail for seeking technical assistance. 42.4% of respondents prefer using telephones and only 2.1% prefer using face to face. Only one respondent (.1%) wanted to use mail.

Table 6.4 The preferred method in case of portal problems

| Methods in case of portal problem method | Frequency | Percent |
|---|---|---|
| Email | 370 | 48.7 |
| Phone call | 322 | 42.4 |
| Using the Portal | 50 | 6.6 |
| Face to face | 16 | 2.1 |
| Mail | 1 | .1 |

**Preferred Ministry of Higher Education portal services**

Ministry of Higher Education (MOHE) portal provides its e-services in four categories. The first category is “My information services”. The services under this

category related to all kinds of information update. Table 6.5 below shows that the highest used service is “edit academic date” with 40.2%, followed by “electronic file update” with 29.8%.

Table 6.5 My information services

| My information services | Frequency | Percent |
|---|---|---|
| Edit academic data | 305 | 40.2 |
| Electronic file update | 226 | 29.8 |
| Edit personal data | 82 | 10.8 |
| Academic reports | 58 | 7.6 |
| Edit contacting information | 46 | 6.1 |
| Edit dependents data | 22 | 2.9 |
| Change passport info | 18 | 2.4 |
| Edit qualification data | 2 | .3 |

The second category is personal services. The services under this category relate to many personal requests and enquiries. Table 6.6 shows that the highest e-service used by the respondents was “follow-up request” with 72.1%.

Table 6.6 Personal services

| Personal services | Frequency | Percent |
|---|---|---|
| Follow-up requests | 547 | 72.1 |
| Ticket booking order | 97 | 12.8 |
| Acquainting Request | 41 | 5.4 |
| Alerts service | 24 | 3.2 |
| Enquiries | 23 | 3.0 |
| Adding dependents to scholarship | 11 | 1.4 |
| Annual Leave | 10 | 1.3 |
| Request a reward excellence | 6 | .8 |

The third category is financial services. The services of this category related to financial requests. Table 6.7 shows that the highest used service in this category is “compensation request” with 61.3%.

Table 6.7 Financial services

| Financial services | Frequency | Percent |
|---|---|---|
| Compensation Request | 465 | 61.3 |
| Request for financial guarantee | 145 | 19.1 |
| Statement of account | 126 | 16.6 |
| Edit Bank Account Data | 23 | 3.0 |

The forth category is academic services. The services under this category related to all academic requests. Table 6.8 shows that the most used service is "general requests" with 47.7%.

Table 6.8 Academic services

| Academic services | Frequency | Percent |
|---|---|---|
| General requests | 362 | 47.7 |
| Extending Scholarship | 115 | 15.2 |
| Degree Upgrading | 44 | 5.8 |
| Trips and academic conferences | 33 | 4.3 |
| Request training courses | 29 | 3.8 |
| Changing University | 26 | 3.4 |
| Request a scientific trip | 23 | 3.0 |
| Modify scholarship finishing date | 23 | 3.0 |
| Change Major | 22 | 2.9 |
| Open a file for student dependent | 20 | 2.6 |
| Language study continuation | 18 | 2.4 |
| Scholarship Termination | 11 | 1.4 |
| Changing university & major | 9 | 1.2 |
| Modify scholarship starting date | 8 | 1.1 |
| Changing the Scholarship Country | 6 | .8 |
| Changing the language institute | 5 | .7 |
| Request for scientific movement | 4 | .5 |
| Postponing the Scholarship | 1 | .1 |

## 6.3 Final instrument validation

In this section, two tests will be conducted to ensure the instrument validation. The first test is a reliability test to ensure the internal consistency of the scales. The second test is factor analysis to ensure the scales' validity.

### 6.3.1 Reliability

Reliability of measurement refers to whether an instrument can be interpreted consistently across different situations (Field 2009). IBM SPSS20 was used to calculate Cronbach's alpha. Cronbach's alpha is an indicator of internal consistency reliability, assessed by examining the average correlation of each item (question) in a measure with every other question (Cozby & Bates 2012). Scholars suggested 0.7 as the accepted value (Field 2009; Stafford & Turan 2011). Table 6.9 shows the Cronbach's alpha values which are higher than 0.70.

Table 6.9 Scale reliability

| **Scale** | **No. of Items** | **Cronbach's alpha** |
|---|---|---|
| Confirmation | 3 | 0.817 |
| Service Quality (SQ) | 4 | 0.779 |
| Service Comprehensiveness (SC) | 2 | 0.848 |
| Frequency of Past Behaviour (FPB) | 2 | 0.729 |
| Perceived Usefulness (PU) | 4 | 0.908 |
| Satisfaction | 3 | 0.873 |
| Habit | 3 | 0.856 |
| Intention to Use (ITU) | 3 | 0.802 |
| Emotion | 5 | 0.881 |
| E-Government Continuance (EGC) | 4 | 0.861 |
| **Total** | 33 | |

### 6.3.2 Validity of scale

In this study, validity and uni-dimensionality of scale was evaluated through exploratory factor analysis and testing the correlation co-efficient.

#### 6.3.2.1 Exploratory factor analysis

Exploratory factor analysis using principal component was used. IBM SPSS 20 was used to conduct the factor analysis. Scale items will be analysed one by one.

#### 6.3.2.2 Confirmation

Five items were used to measure confirmation. Table 6.10 shows the correlation matrix for these items. This table shows that all the correlation coefficients were

greater than 0.3, which indicates that these items are suitable for factor analysis (Field 2009).

Table 6.10 Correlation and loading matrix for confirmation

| **Correlation Matrix** | | | | |
|---|---|---|---|---|
| | | Confirmation1 | Confirmation2 | Confirmation3 |
| **Correlation** | Confirmation1 | 1.000 | .727 | .512 |
| | Confirmation2 | .727 | 1.000 | .565 |
| | Confirmation3 | .512 | .565 | 1.000 |
| | **Loading** | .878 | .899 | .793 |

After examining the correlation co-efficient, which allowed for extra accurate judgment, additional analysis was conducted. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity were calculated to check if the data set was suitable for factor analysis. The KMO value should be greater than 0.5 (Field 2009). Table 6.11 shows a KMO value of 0.681 and Bartlett's test of sphericity was highly significant ($p<.001$). Thus, it can be said that the data is appropriate for factor analysis.

Table 6.11 KMO and Bartlett's Test for confirmation

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .681 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 885.393 |
| | df | 3 |
| | Sig. | .000 |

The Eigenvalue and the screen plot were tested to identify the number of components in this scale. Table 6.12 shows component one with an eigenvalue of 2.208. Figure 6.1 shows the screen plot of component one.

Table 6.12 Eigenvalue for confirmation scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.208 | 73.611 | 73.611 | 2.208 | 73.611 | 73.611 |
| 2 | .523 | 17.445 | 91.057 | | | |
| 3 | .268 | 8.943 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

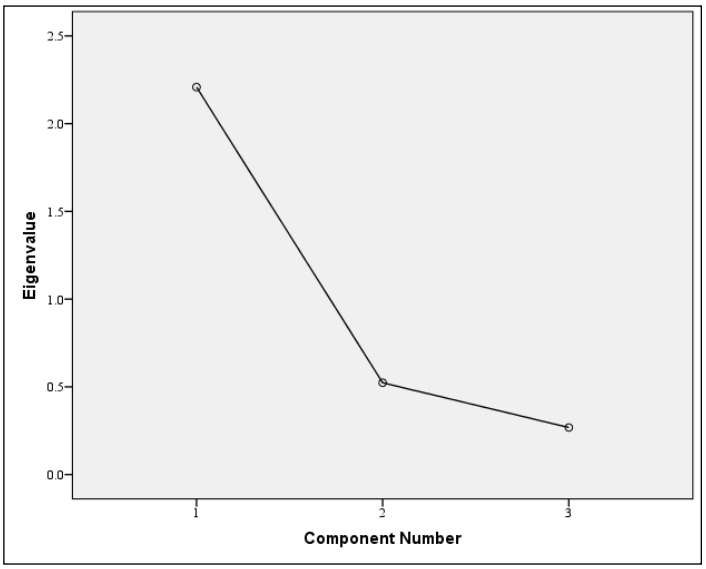

Figure 6.1 Confirmation plot

Finally, the factor loading of scale items was calculated. The recommended factor loading value depends on the sample size e.g. when the sample size is more than 600, the recommended factor loading should be greater than 0.21 (Field 2009). Therefore, the factor loading of this study should be greater than 0.21. Table 6.10 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that all three items of confirmation are unidimensional.

#### 6.3.2.3 Service quality

Four items were used to measure service quality. Table 6.13 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3 which indicates that these items are suitable for factor analysis (Field 2009).

Table 6.13 Correlation and loading matrix for service quality

| **Correlation Matrix** | | | | | |
|---|---|---|---|---|---|
| | | SQ1 | SQ2 | SQ3 | SQ4 |
| **Correlation** | SQ1 | 1.000 | .722 | .437 | .497 |
| | SQ2 | .722 | 1.000 | .379 | .450 |
| | SQ3 | .437 | .379 | 1.000 | .392 |
| | SQ4 | .497 | .450 | .392 | 1.000 |
| | **Loading** | .869 | .835 | .677 | .737 |

Table 6.14 shows a KMO value of 0.732, which is greater than the recommended 0.3. Bartlett's test of sphericity is also highly significant (p<.001). Therefore, the data is appropriate for factor analysis.

Table 6.14 KMO and Bartlett's Test for service quality

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .732 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 991.145 |
| | df | 6 |
| | Sig. | .000 |

The eigenvalue and the screen plot were tested. Table 6.15 shows one component with an eigenvalue of 2.455 and the screen plot in Figure 6.2 confirms this.

Table 6.15 Eigenvalue for service quality scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.455 | 61.384 | 61.384 | 2.455 | 61.384 | 61.384 |
| 2 | .687 | 17.164 | 78.548 | | | |
| 3 | .585 | 14.618 | 93.166 | | | |
| 4 | .273 | 6.834 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

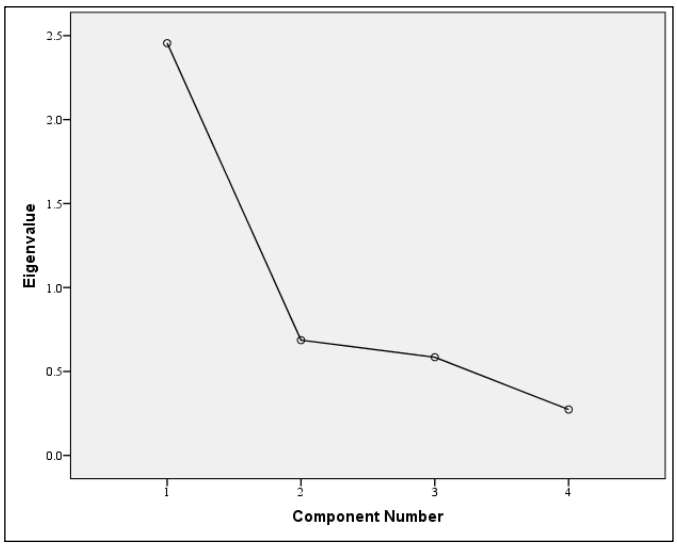


Figure 6.2 Service quality plot

The recommended factor loading value depends on the sample size e.g. when the sample size is more than 600, the recommended factor loading should be greater than 0.21 (Field 2009). Therefore, the factor loading of this study should be greater than 0.21. Table 6.13 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that all four items of service quality are unidimensional.

#### 6.3.2.4 Service comprehensiveness

The same process has been repeated. Two items were used to measure service comprehensiveness. Table 6.16 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3, which indicates that these items are suitable for factor analysis.

Table 6.16 Correlation and loading matrix for service comprehensiveness

| **Correlation Matrix** | | | |
|---|---|---|---|
| | | SC1 | SC2 |
| **Correlation** | SC1 | 1.000 | .735 |
| | SC2 | .735 | 1.000 |
| | **Loading** | .932 | .932 |

Both KMO and Bartlett's test of sphericity are calculated. Table 6.17 shows the KMO value is 0.500, which is greater than the recommended 0.3. Bartlett's test of sphericity is also highly significant ($p<.001$). Therefore, the data is appropriate for factor analysis.

Table 6.17 KMO and Bartlett's Test for service comprehensiveness

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .500 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 589.022 |
| | df | 1 |
| | Sig. | .000 |

The eigenvalue and the screen plot were tested. Table 6.18 shows one component with an eigenvalue of 1.735 and the screen plot in Figure 6.3 confirms this.

Table 6.18 Eigenvalue for service comprehensiveness scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 1.735 | 86.775 | 86.775 | 1.735 | 86.775 | 86.775 |
| 2 | .265 | 13.225 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

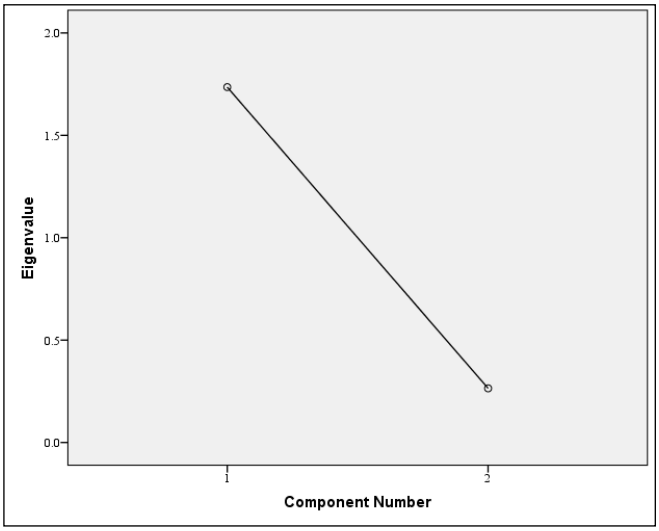


Figure 6.3 Service comprehensiveness plot

Based on the sample size of the study, the factor loading of this study should be greater than 0.21. Table 6.13 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that both items of service comprehensiveness are unidimensional.

### 6.3.2.5 Frequency of past behaviour

Two items were used to measure frequency of past behaviour. Table 6.19 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3, which indicates that these items are suitable for factor analysis.

Table 6.19 Correlation and loading matrix for frequency of past behaviour

| **Correlation Matrix** | | | |
|---|---|---|---|
| | | FPB1 | FPB2 |
| **Correlation** | FPB1 | 1.000 | .579 |
| | FPB2 | .579 | 1.000 |
| | **Loading** | .888 | .888 |

KMO and Bartlett's test of sphericity are calculated. Table 6.20 shows a KMO value of 0.500, which is greater than the recommended 0.3. Bartlett's test of sphericity is also highly significant (p<.001). Therefore, the data is appropriate for factor analysis.

Table 6.20 KMO and Bartlett's Test for frequency of past behaviour

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .500 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 308.448 |
| | df | 1 |
| | Sig. | .000 |

The eigenvalue and the screen plot were tested. Table 6.21 shows one component with an eigenvalue of 1.579 and the screen plot in Figure 6.4 confirm this.

Table 6.21 Eigenvalue for frequency of past behaviour scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Compone | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| nt | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 1.579 | 78.933 | 78.933 | 1.579 | 78.933 | 78.933 |
| 2 | .421 | 21.067 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

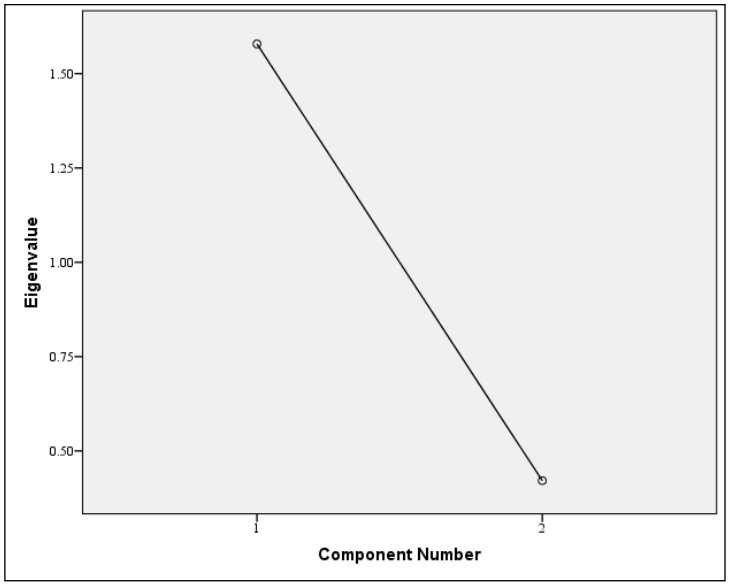


Figure 6.4 Frequency of past behaviour

Based on the sample size of the study, the factor loading of this study should be greater than 0.21. Table 6.19 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that both items of frequency of past behaviour are unidimensional.

#### 6.3.2.6 Perceived usefulness

Four items were used to measure perceived usefulness. Table 6.22 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3, which indicates that these items are suitable for factor analysis.

Table 6.22 Correlation and loading matrix for perceived usefulness

| **Correlation Matrix** | | | | | |
|---|---|---|---|---|---|
| | | PU1 | PU2 | PU3 | PU4 |
| **Correlation** | PU1 | 1.000 | .745 | .682 | .644 |
| | PU2 | .745 | 1.000 | .751 | .673 |
| | PU3 | .682 | .751 | 1.000 | .774 |
| | PU4 | .644 | .673 | .774 | 1.000 |
| | **Loading** | .865 | .896 | .908 | .872 |

KMO and Bartlett's test of sphericity are calculated. Table 6.23 shows a KMO value of 0.822, which is greater than the recommended 0.3. Bartlett's test of sphericity is also highly significant ($p<.001$). Consequently, the data is appropriate for factor analysis.

Table 6.23 KMO and Bartlett's Test for perceived usefulness

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .822 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2050.930 |
| | df | 6 |
| | Sig. | 0.000 |

The eigenvalue and the screen plot were tested. Table 6.24 shows one component with an eigenvalue of 3.136 and the screen plot in Figure 6.5 confirm this.

Table 6.24 Eigenvalue for perceived usefulness scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3.136 | 78.396 | 78.396 | 3.136 | 78.396 | 78.396 |
| 2 | .400 | 10.006 | 88.402 | | | |
| 3 | .263 | 6.579 | 94.981 | | | |
| 4 | .201 | 5.019 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

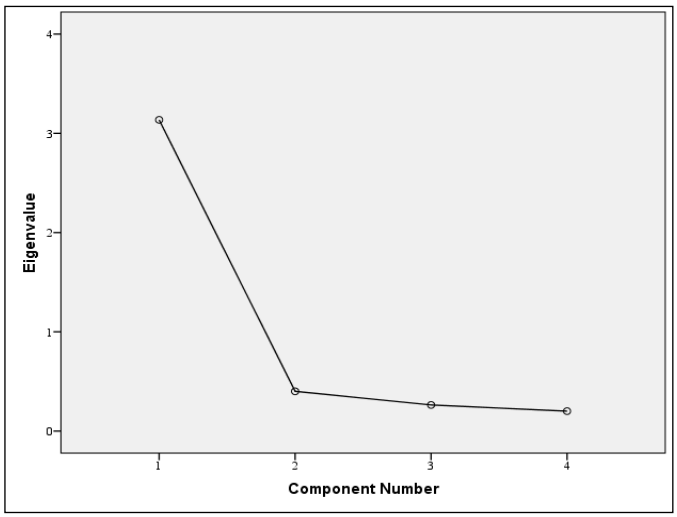

Figure 6.5 Perceived usefulness plot

Based on the sample size of the study, the factor loading of this study should be greater than 0.21. Table 6.22 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that all four items of perceived usefulness are unidimensional.

### 6.3.2.7 Satisfaction

Three items were used to measure satisfaction. Table 6.25 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3, which indicates that these items are suitable for factor analysis.

Table 6.25 Correlation and loading matrix for satisfaction

| **Correlation Matrix** | | | | |
|---|---|---|---|---|
| | | Satisfaction1 | Satisfaction2 | Satisfaction3 |
| **Correlation** | Satisfaction1 | 1.000 | .787 | .612 |
| | Satisfaction2 | .787 | 1.000 | .688 |

| | | | | |
|---|---|---|---|---|
| | Satisfaction3 | .612 | .688 | 1.000 |
| | **Loading** | .898 | .928 | .852 |

Both KMO and Bartlett's test of sphericity are calculated. Table 6.26 shows a KMO value of 0.707, which is greater than the recommended 0.3. Bartlett's test of sphericity is also highly significant (p<.001). Therefore, the data is appropriate for factor analysis.

Table 6.26 KMO and Bartlett's Test for satisfaction

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .707 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1232.988 |
| | df | 3 |
| | Sig. | .000 |

The eigenvalue and the screen plot were tested. Table 6.27 shows one component with an eigenvalue of 2.394 and the screen plot in Figure 6.6 confirm this.

Table 6.27 Eigenvalue for satisfaction scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.394 | 79.784 | 79.784 | 2.394 | 79.784 | 79.784 |
| 2 | .404 | 13.465 | 93.249 | | | |
| 3 | .203 | 6.751 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

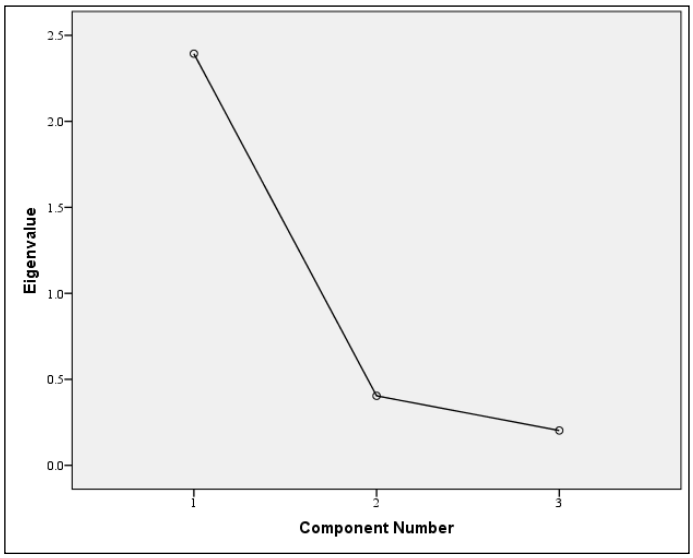

Figure 6.6 Satisfaction plot

Based on the sample size of the study, the factor loading of this study should be greater than 0.21. Table 6.25 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that all three items of satisfaction are unidimensional.

6.3.2.8 Habit

Three items were used to measure habit. Table 6.28 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3, which indicates that these items are suitable for factor analysis.

Table 6.28 Correlation and loading matrix for habit

| **Correlation Matrix** | | | | |
|---|---|---|---|---|
| | | Habit1 | Habit2 | Habit3 |
| **Correlation** | Habit1 | 1.000 | .677 | .656 |
| | Habit2 | .677 | 1.000 | .665 |
| | Habit3 | .656 | .665 | 1.000 |
| | **Loading** | .882 | .886 | .877 |

Both KMO and Bartlett's test of sphericity are calculated. Table 6.29 shows a KMO value of 0.735, which is greater than the recommended 0.3. Bartlett's test of sphericity is also highly significant ($p<.001$). Therefore, the data is appropriate for factor analysis.

Table 6.29 KMO and Bartlett's Test for habit

| KMO and Bartlett's Test | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .735 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1018.808 |
| | df | 3 |
| | Sig. | .000 |

The eigenvalue and the screen plot were tested. Table 6.30 shows one component with an eigenvalue of 2.332 and the screen plot in Figure 6.7 confirm this.

Table 6.30 Eigenvalue for habit scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.332 | 77.728 | 77.728 | 2.332 | 77.728 | 77.728 |
| 2 | .346 | 11.532 | 89.260 | | | |
| 3 | .322 | 10.740 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

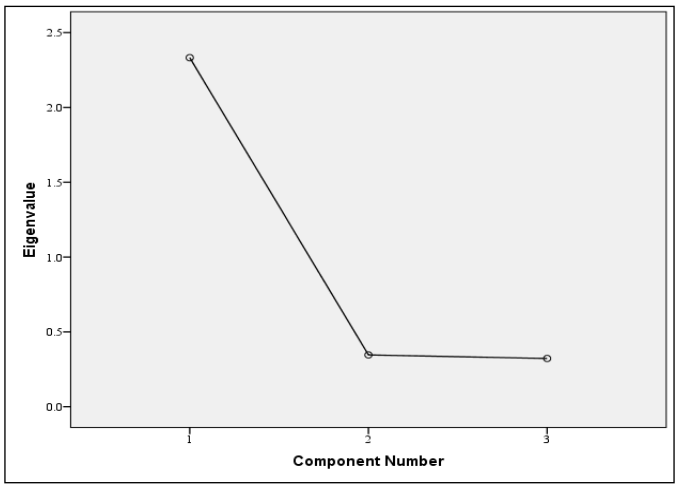

Figure 6.7 Habit plot

Based on the sample size of the study, the factor loading of this study should be greater than 0.21. Table 6.28 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that all three items of habit are unidimensional.

6.3.2.9 Intention to use

Three items were used to measure intention to use. Table 6.31 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3 which indicates that these items are suitable for factor analysis.

Table 6.31 Correlation and loading matrix for intention to use

| **Correlation Matrix** | | | | |
|---|---|---|---|---|
| | | ITU1 | ITU2 | ITU3 |
| **Correlation** | ITU1 | 1.000 | .553 | .547 |
| | ITU2 | .553 | 1.000 | .631 |
| | ITU3 | .547 | .631 | 1.000 |
| | **Loading** | .820 | .862 | .860 |

Both KMO and Bartlett's test of sphericity are calculated. Table 6.32 shows a KMO value of 0.706, which is greater than the recommended 0.3. Bartlett's test of sphericity is also highly significant (p<.001). Therefore, the data is appropriate for factor analysis.

Table 6.32 KMO and Bartlett's Test for intention to use

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .706 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 734.622 |
| | df | 3 |
| | Sig. | .000 |

The eigenvalue and the screen plot were tested. Table 6.33 shows one component with an eigenvalue of 2.155 and the screen plot in Figure 6.8 confirms this.

Table 6.33 Eigenvalue for intention to use scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.155 | 71.830 | 71.830 | 2.155 | 71.830 | 71.830 |
| 2 | .476 | 15.877 | 87.708 | | | |
| 3 | .369 | 12.292 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

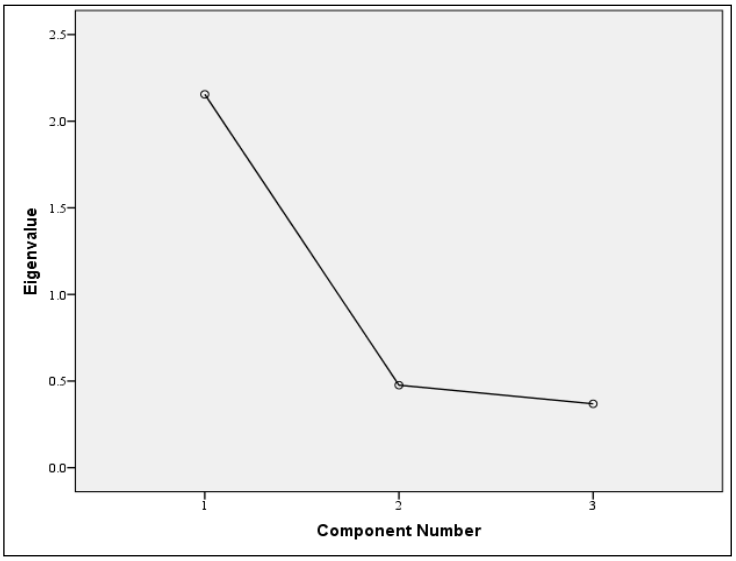

Figure 6.8 Intention to use plot

Based on the sample size of the study, the factor loading of this study should be greater than 0.21. Table 6.31 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded all three items of intention to use are unidimensional.

6.3.2.10 E-government continuance

Four items were used to measure e-government continuance. Table 6.34 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3, which indicates that these items are suitable for factor analysis.

Table 6.34 Correlation and loading matrix for e-government continuance

| **Correlation Matrix** | | | | | |
|---|---|---|---|---|---|
| | | EGC1 | EGC2 | EGC3 | EGC4 |
| **Correlation** | EGC1 | 1.000 | .683 | .623 | .524 |
| | EGC2 | .683 | 1.000 | .634 | .558 |
| | EGC3 | .623 | .634 | 1.000 | .644 |
| | EGC4 | .524 | .558 | .644 | 1.000 |
| | **Loading** | .842 | .857 | .864 | .804 |

Both KMO and Bartlett's test of sphericity are calculated. Table 6.35 shows a KMO value of 0.806, which is greater than the recommended 0.3. Bartlett's test of

sphericity is also highly significant (p<.001). Therefore, the data is appropriate for factor analysis.

Table 6.35 KMO and Bartlett's Test for e-government continuance

| KMO and Bartlett's Test | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .806 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1417.302 |
| | df | 6 |
| | Sig. | .000 |

The eigenvalue and the screen plot were tested. Table 6.36 shows one component with an eigenvalue of 2.842 and the screen plot in Figure 6.9 confirms this.

Table 6.36 Eigenvalue for e-government continuance scale

Total Variance Explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.835 | 70.884 | 70.884 | 2.835 | 70.884 | 70.884 |
| 2 | .518 | 12.959 | 83.842 | | | |
| 3 | .333 | 8.326 | 92.168 | | | |
| 4 | .313 | 7.832 | 100.000 | | | |

Extraction Method: Principal Component Analysis.

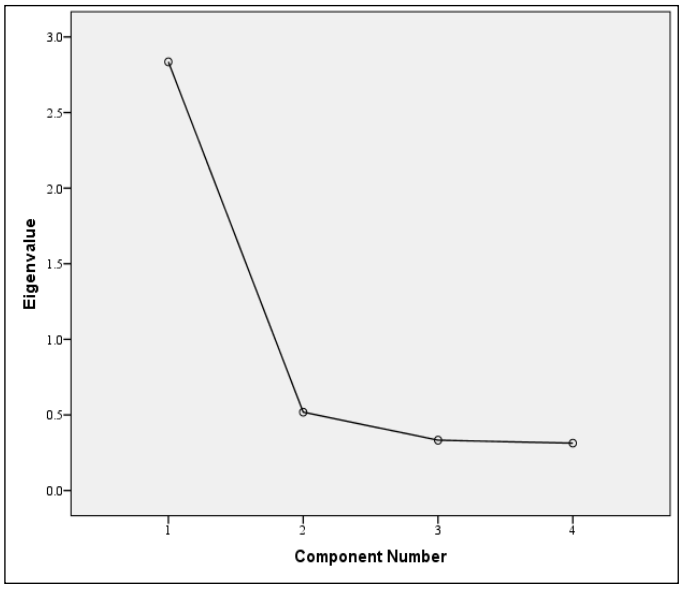


Figure 6.9 E-government continuance plot

Based on the sample size of the study, the factor loading of this study should be greater than 0.21. Table 6.34 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that all four items of e-government continuance are unidimensional.

#### 6.3.2.11 Emotion

Five items were used to measure emotion. Table 6.37 shows the correlation matrix for these items. This table shows that all the correlation coefficients are greater than 0.3, which indicates that these items are suitable for factor analysis.

Table 6.37 Correlation and loading matrix for emotion

| **Correlation Matrix** | | | | | | |
|---|---|---|---|---|---|---|
| | | Emotion1 | Emotion2 | Emotion3* | Emotion4* | Emotion5* |
| **Correlation** | Emotion1 | 1.000 | .683 | .490 | .466 | .487 |
| | Emotion2 | .683 | 1.000 | .414 | .452 | .460 |
| | Emotion3* | .490 | .414 | 1.000 | .883 | .790 |
| | Emotion4* | .466 | .452 | .883 | 1.000 | .806 |
| | Emotion5* | .487 | .460 | .790 | .806 | 1.000 |
| | **Loading** | .734 | .700 | .891 | .897 | .878 |

***** (reverse coded)

Both KMO and Bartlett's test of sphericity are calculated. Table 6.38 shows a KMO value of 0.777, which is greater than the recommended 0.3. Bartlett's test of sphericity is also highly significant ($p<.001$). Therefore, the data is appropriate for factor analysis.

Table 6.38 KMO and Bartlett's Test for emotion

| **KMO and Bartlett's Test** | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .777 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2755.176 |
| | df | 10 |
| | Sig. | 0.000 |

The eigenvalue and the screen plot were tested. Table 6.39 shows one component with an eigenvalue of 3.399 and the screen plot in Figure 6.10 confirms this.

Table 6.39 Eigenvalue for emotion scale

| Total Variance Explained | | | | | | |
|---|---|---|---|---|---|---|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3.399 | 67.973 | 67.973 | 3.399 | 67.973 | 67.973 |
| 2 | .941 | 18.815 | 86.788 | | | |
| 3 | .321 | 6.430 | 93.218 | | | |
| 4 | .228 | 4.555 | 97.772 | | | |
| 5 | .111 | 2.228 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

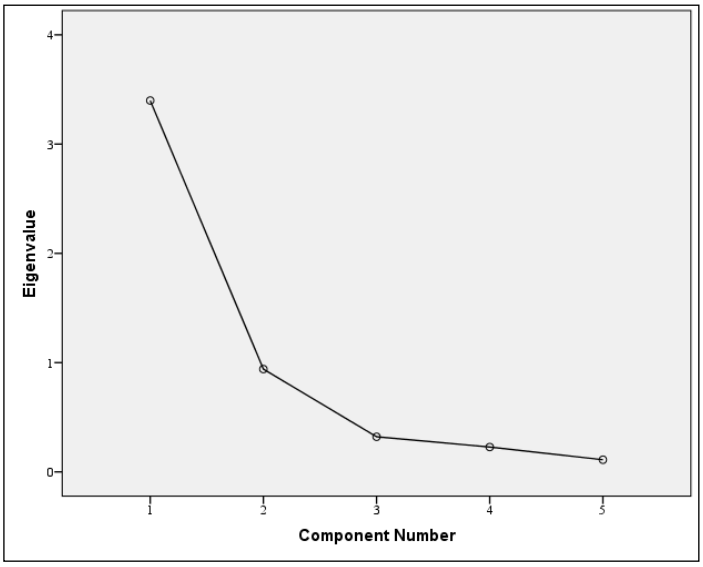

Figure 6.10 Emotion plot

Based on the sample size of the study, the factor loading of this study should be greater than 0.21. Table 6.37 shows that the factor loading for the items is greater than 0.21, which exceeds the cut-off level. Based on the previous tests, it can be concluded that all five items of emotion are unidimensional.

### 6.3.3 Confirmatory factor analysis

Confirmatory factor analysis (CFA) was used to evaluate construct validity of all the research scales. The objective of CFA is to test whether the data fit a hypothesized measurement model, so CFA is frequently used as a first step to assess the proposed measurement model in a Structural Equation Model (Padilla-Meléndez *et al.* 2013). CFA was estimated as a preliminary step to confirm the factor structure and to provide an initial test of reliability and validity of the factors (Olsen *et al.* 2013).

Thus I ran a CFA for the model. Table 6.40 below, shows all the items which exceeded the cut-off level of 4.0. Also, items were loaded on their expected factors and there was no overlap between the measures. Table 6.41 below, shows the Average Variance Extracted (AVE) from each construct exceeding the recommended lower limit of 0.50 (Fornell & Larcker 1981; Fink 2010). It can be concluded that all tests provide support for convergent validity among the constructs.

Discriminant validity measures whether factors are statistically different from each other or not (Al-Debei *et al.* 2012). The AVE of each variable should be greater than the squared correlation between a pair of latent variables. In this research, all these requirements were met (see Table 6.41 below) which provides support for the discriminant validity among the constructs.

Table 6.40 Results of confirmatory factor analysis for the measurement scales

| | SC | Confirmation | EGC | Emotion | FPB | Habit | ITU | SQ | Satisfaction | PU |
|---|---|---|---|---|---|---|---|---|---|---|
| **Confirmation1** | 0.3607 | 0.8977 | 0.1761 | 0.2693 | 0.2525 | 0.3464 | 0.2115 | 0.3072 | 0.3097 | 0.3184 |
| **Confirmation2** | 0.3009 | 0.9029 | 0.1373 | 0.2517 | 0.2071 | 0.3117 | 0.1644 | 0.2975 | 0.2507 | 0.3175 |
| **Confirmation3** | 0.2349 | 0.7636 | 0.151 | 0.2338 | 0.1864 | 0.2939 | 0.1544 | 0.2295 | 0.2051 | 0.2249 |
| **EGC1** | 0.1437 | 0.1929 | 0.8464 | 0.1701 | 0.2304 | 0.2538 | 0.3466 | 0.251 | 0.4239 | 0.2257 |
| **EGC2** | 0.1299 | 0.1803 | 0.8588 | 0.1584 | 0.1842 | 0.278 | 0.2289 | 0.245 | 0.3916 | 0.2288 |
| **EGC3** | 0.0898 | 0.1254 | 0.8625 | 0.156 | 0.178 | 0.2613 | 0.437 | 0.2584 | 0.3857 | 0.2011 |
| **EGC4** | 0.0608 | 0.1038 | 0.7984 | 0.0833 | 0.1336 | 0.2093 | 0.3397 | 0.2091 | 0.388 | 0.1574 |
| **Emotion1** | 0.3059 | 0.3037 | 0.158 | 0.843 | 0.2936 | 0.4035 | 0.2182 | 0.2524 | 0.2594 | 0.4543 |
| **Emotion2** | 0.3409 | 0.2747 | 0.1867 | 0.8387 | 0.2636 | 0.3611 | 0.1677 | 0.2206 | 0.1634 | 0.4007 |
| **Emotion3** | 0.2102 | 0.1656 | 0.1169 | 0.7855 | 0.1637 | 0.2404 | 0.0809 | 0.0948 | 0.1022 | 0.2502 |
| **Emotion4** | 0.2304 | 0.197 | 0.0676 | 0.7817 | 0.1684 | 0.2443 | 0.0435 | 0.0969 | 0.0668 | 0.2613 |
| **Emotion5** | 0.2146 | 0.1389 | 0.0513 | 0.7623 | 0.1655 | 0.2253 | 0.0692 | 0.0681 | 0.0884 | 0.2231 |
| **FPB1** | 0.2531 | 0.2064 | 0.1934 | 0.2411 | 0.886 | 0.2093 | 0.2626 | 0.2155 | 0.2346 | 0.3227 |
| **FPB2** | 0.2015 | 0.2438 | 0.1924 | 0.2638 | 0.8909 | 0.3611 | 0.2831 | 0.2323 | 0.2265 | 0.3486 |
| **Habit1** | 0.2884 | 0.3447 | 0.2901 | 0.3298 | 0.3059 | 0.8857 | 0.3466 | 0.291 | 0.2956 | 0.4086 |
| **Habit2** | 0.2975 | 0.3114 | 0.2472 | 0.3359 | 0.3259 | 0.8828 | 0.3279 | 0.2423 | 0.2459 | 0.437 |
| **Habit3** | 0.3305 | 0.3237 | 0.2517 | 0.3812 | 0.3947 | 0.8763 | 0.2755 | 0.2626 | 0.2469 | 0.4932 |
| **ITU1** | 0.0827 | 0.1531 | 0.3097 | 0.1386 | 0.2138 | 0.2702 | 0.8142 | 0.2697 | 0.4904 | 0.2735 |
| **ITU2** | 0.1451 | 0.2159 | 0.4239 | 0.1762 | 0.2918 | 0.3319 | 0.8619 | 0.2862 | 0.3916 | 0.347 |
| **ITU3** | 0.0798 | 0.1598 | 0.4932 | 0.1247 | 0.2724 | 0.3101 | 0.8653 | 0.3152 | 0.542 | 0.2896 |
| **PU1** | 0.3449 | 0.3031 | 0.2141 | 0.3975 | 0.3399 | 0.4643 | 0.2785 | 0.3065 | 0.2451 | 0.8591 |
| **PU2** | 0.3232 | 0.296 | 0.208 | 0.4035 | 0.3468 | 0.4468 | 0.3328 | 0.3079 | 0.2834 | 0.8948 |
| **PU3** | 0.3464 | 0.2998 | 0.2238 | 0.3648 | 0.3493 | 0.4591 | 0.3268 | 0.3141 | 0.2998 | 0.9091 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **PU4** | 0.2954 | 0.3043 | 0.2139 | 0.3694 | 0.3042 | 0.4235 | 0.3276 | 0.2876 | 0.3051 | 0.8775 |
| **SC1** | 0.9357 | 0.3542 | 0.121 | 0.3239 | 0.2416 | 0.3318 | 0.1185 | 0.2423 | 0.0971 | 0.3554 |
| **SC2** | 0.9273 | 0.3053 | 0.1162 | 0.3178 | 0.2343 | 0.3128 | 0.1067 | 0.2185 | 0.0803 | 0.3316 |
| **SQ1** | 0.2405 | 0.2959 | 0.2269 | 0.1761 | 0.2048 | 0.2591 | 0.2347 | 0.8439 | 0.3739 | 0.3053 |
| **SQ2** | 0.1477 | 0.2623 | 0.2037 | 0.1507 | 0.2009 | 0.2075 | 0.244 | 0.8009 | 0.3397 | 0.2594 |
| **SQ3** | 0.1457 | 0.2512 | 0.1896 | 0.1641 | 0.1381 | 0.1978 | 0.2289 | 0.6865 | 0.3368 | 0.1922 |
| **SQ4** | 0.2249 | 0.2225 | 0.2629 | 0.1792 | 0.2316 | 0.2651 | 0.3435 | 0.7859 | 0.4528 | 0.3003 |
| **Satisfaction1** | 0.1004 | 0.2775 | 0.4339 | 0.178 | 0.2392 | 0.2798 | 0.3239 | 0.4377 | 0.9018 | 0.2868 |
| **Satisfaction2** | 0.1119 | 0.2785 | 0.4345 | 0.1984 | 0.2521 | 0.2789 | 0.4338 | 0.4538 | 0.9297 | 0.3259 |
| **Satisfaction3** | 0.0379 | 0.2538 | 0.3947 | 0.1436 | 0.201 | 0.2393 | 0.3367 | 0.4164 | 0.846 | 0.2432 |

Table 6.41 Average variance extracted for the measurement scales

| | SC | Confirmation | EGC | Emotion | FPB | Habit | ITU | SQ | Satisfaction | PU |
|---|---|---|---|---|---|---|---|---|---|---|
| **SC** | 0.8677 | | | | | | | | | |
| **Confirmation** | 0.12581 | 0.7347 | | | | | | | | |
| **EGC** | 0.01623 | 0.032544 | 0.7088 | | | | | | | |
| **Emotion** | 0.11868 | 0.08626 | 0.02904 | 0.6447 | | | | | | |
| **FPB** | 0.06528 | 0.064313 | 0.04713 | 0.08083 | 0.7893 | | | | | |
| **Habit** | 0.11992 | 0.137493 | 0.08922 | 0.1565 | 0.53641 | 0.7772 | | | | |
| **ITU** | 0.01467 | 0.043347 | 0.23021 | 0.02979 | 0.09443 | 0.12924 | 0.7182 | | | |
| **SQ** | 0.06136 | 0.107453 | 0.08231 | 0.04657 | 0.06355 | 0.09084 | 0.11786 | 0.6107 | | |
| **Satisfaction** | 0.00912 | 0.091506 | 0.22269 | 0.03814 | 0.06729 | 0.08916 | 0.37234 | 0.23844 | 0.7977 | |
| **PU** | 0.13624 | 0.11526 | 0.0589 | 0.18732 | 0.14281 | 0.25573 | 0.12838 | 0.11772 | 0.103105 | 0.784 |

## 6.4 Test of model fit

Before examining the structural model, the model fit should be established (Parent *et al.* 2005). The model fit statistics reported below are consistent with those suggested by Gefen *et al.* (2000). A goodness of fit index (GFI) value is suggested to be over 0.90 and the goodness of fit adjusted for degrees of freedom (AGFI) value is suggested to be over 0.80 (Byrne 1994; Hair Jr *et al.* 1995; Chin 1998). *In this study, the GFI value of the model is 0.923,* which is above the suggested cut-off value. *The AGFI value is 0.816,* which is above the suggested cut-off value.

Because of the many constructs added to the ECT model, a comparative fit index (CFI) is also recommended (Byrne 1994; Hair Jr *et al.* 1995). The CFI of this model is 0.867, which is acceptable (Hooper *et al.* 2008). The normed fit index (NFI) also provides an acceptable fit with a value of 0.860 (Hooper *et al.* 2008). The root mean square error of approximation (RMSEA) is 0.139, which indicates a good fit (Hooper *et al.* 2008). A summary is provided in Table 6.42.

Table 6.42 Goodness of fit measures

| Measure | Estimate | Suggested | Conclusion |
|---|---|---|---|
| Goodness of fit index (GFI) | 0.923 | >0.90 | Good |
| Adjusted goodness of fit (AGFI) | 0.816 | >0.80 | Good |
| Comparative fit index (CFI) | 0.867 | >0.90 | Acceptable |
| Normed fit index (NFI) | 0.860 | >0.90 | Acceptable |
| Root mean square error of approximation (RMSEA) | 0.139 | 0.08 to 0.10 | Good |

## 6.5 Test of structural model

Previously, the reliability and validity of the structural model were tested. The results of these tests show satisfactory reliability and validity. The items of the measurement scale were able to measure the constructs of this study. In this section, the proposed structural model was tested using two criteria. The first criterion is the model ability to explain the variance in the dependent variables. The second criterion is the significant of the path coefficients. These two criteria were tested using SEM. SEM

was applied using IBM AMOS 21. Figure 6.11 shows the research model and associated hypothesis.

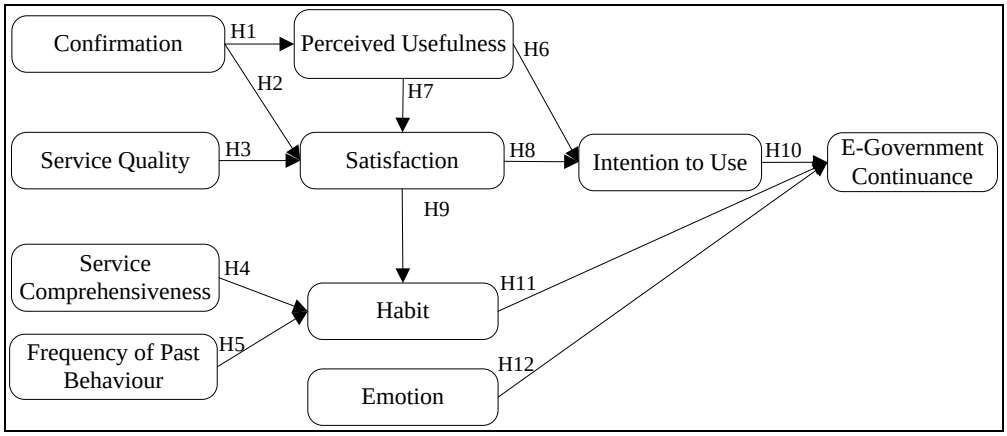


Figure 6.11 The research model and associated hypothesis

### 6.5.1 Variance explained

To evaluate the model, the model's ability to explain the variance in the dependent variables was tested. Table 6.43 shows $R^2$ values for all dependant variables. Only 11% of the variance in perceived usefulness was explained by confirmation. Confirmation and service quality explained 25% of the variance in satisfaction. In addition, perceived usefulness and satisfaction explained 38% of the variance of intention to use. Intention to use, habit and emotion explained 42% of the variance of e-government continuance. Finally, service comprehensiveness and frequency of past behaviour explained 57% of habit.

Table 6.43 R square values

| **Construct** | **$R^2$** |
|---|---|
| Perceived usefulness | 0.11 |
| Satisfaction | 0.25 |
| Intention to use | 0.38 |
| E-government continuance | 0.42 |
| Habit | 0.57 |

### 6.5.2 Assessment of path coefficients

The second criterion is the significance of the path coefficients. It was assessed by using regression analysis. Table 6.44 shows lists of the path co-efficient, standard deviation and beta coefficient for each of the proposed hypotheses. The Regression beta value has three different levels: highly significant (p<.001); significant (p<.01); and intermediate level of significant (p<.05). As a result, the emotion to e-government continuance path is not significant.

Table 6.44 Significance of path coefficients

| Path | | | Path coeff. | Std. Dev. | Critical ratio |
|---|---|---|---|---|---|
| Perceived Usefulness | ← | Confirmation | .33*** | .04 | 9.76 |
| Satisfaction | ← | Perceived Usefulness | .15*** | .02 | 4.38 |
| Satisfaction | ← | Service Quality | .39*** | .03 | 11.43 |
| Satisfaction | ← | Confirmation | .12*** | .03 | 3.54 |
| Habit | ← | Service Comprehensiveness | .17*** | .03 | 6.86 |
| Habit | ← | Frequency of Past Behaviour | .67*** | .02 | 26.24 |
| Intention to Use | ← | Satisfaction | .55*** | .03 | 18.55 |
| Habit | ← | Satisfaction | .11*** | .03 | 4.47 |
| Intention to Use | ← | Perceived Usefulness | .18*** | .02 | 6.08 |
| E-Government Continuance | ← | Intention to Use | .63*** | .03 | 21.49 |
| E-Government Continuance | ← | Habit | .06* | .02 | 1.97 |
| E-Government Continuance | ← | Emotion | .03 | .02 | .97 |

*p<0.05
** p<0.01
***p<0.001

## 6.6 Hypotheses testing

The research model has 12 hypotheses. Figure 6.12 shows the result of the testing using IBM AMOS21.

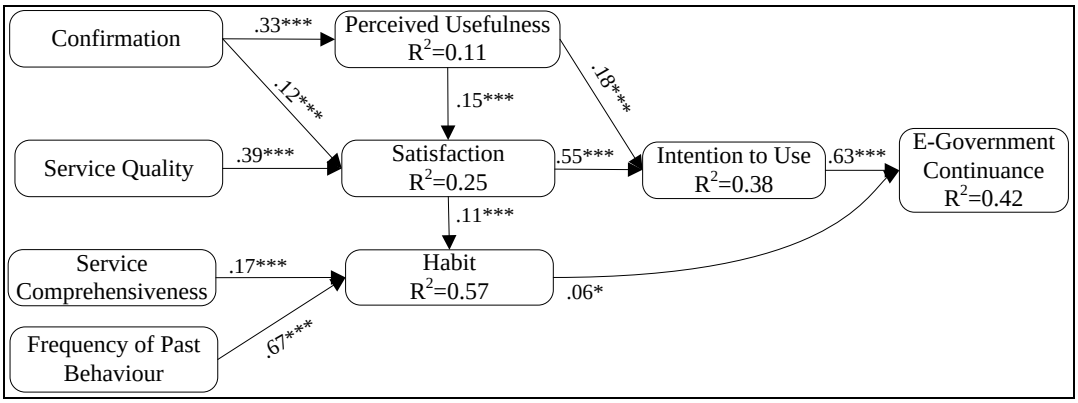


Figure 6.12 Structural model testing

The results of hypotheses testing are described as following:

Hypothesis 1: There is a direct and positive relationship between confirmation and perceived usefulness.
Confirmation demonstrates a significant positive relationship towards perceived usefulness. Therefore, this hypothesis was supported.

Hypothesis 2: There is a direct and positive relationship between confirmation and satisfaction.
Confirmation demonstrates a significant positive relationship towards satisfaction. Therefore, this hypothesis was supported.

Hypothesis 3: There is a direct and positive relationship between service quality and satisfaction.
Service quality demonstrates a significant positive relationship towards satisfaction. Therefore, this hypothesis was supported.

Hypothesis 4: There is a direct and positive relationship between service comprehensiveness and habit.
Service comprehensiveness demonstrates a significant positive relationship towards habit. Therefore, this hypothesis was supported.

Hypothesis 5: There is a direct and positive relationship between frequency of past behaviour and habit.

Frequency of past behaviour demonstrates a significant positive relationship towards habit. Therefore, this hypothesis was supported.

Hypothesis 6: There is a direct and positive relationship between perceived usefulness and intention to use.
Perceived usefulness demonstrates a significant positive relationship towards intention to use. Therefore, this hypothesis was supported.

Hypothesis 7: There is a direct and positive relationship between perceived usefulness and satisfaction.
Perceived usefulness demonstrates a significant positive relationship towards satisfaction. Therefore, this hypothesis was supported.

Hypothesis 8: There is a direct and positive relationship between satisfaction and intention to use.
Satisfaction demonstrates a significant positive relationship towards intention to use. Therefore, this hypothesis was supported.

Hypothesis 9: There is a direct and positive relationship between satisfaction and habit.
Satisfaction demonstrates a significant positive relationship towards habit. Therefore, this hypothesis was supported.

Hypothesis10: There is a direct and positive relationship between intention to use and e-government continuance.
Intention to use demonstrates a significant positive relationship towards e-government continuance. Therefore, this hypothesis was supported.

Hypothesis 11: There is a direct and positive relationship between habit and e-government continuance.
Habit demonstrates a significant positive relationship towards e-government continuance. Therefore, this hypothesis was supported.

Hypothesis 12: There is a direct and positive relationship between emotion and e-government continuance.

Emotion did not demonstrate a significant positive relationship towards e-government continuance. Therefore, this hypothesis was not supported.

## 6.7 Assessment of relationship strength

The correlation co-efficient is a commonly used measure of the size of an effect: values of ±.1 represent a small effect, ±.3 is a medium effect and ±.5 is a large effect (Field 2009). As can be seen in Figure 6.12, the relationships were in three categories based on their strength.

The following relationships have a large effect:

- The relationship between frequency of past behaviour and habit.
- The relationship between satisfaction and intention to use.
- The relationship between intention to use and e-government continuance.

The following relationships have a medium effect:

- The relationship between confirmation and perceived usefulness.
- The relationship between service quality and satisfaction.

The following relationships have a small effect:

- The relationship between confirmation and satisfaction.
- The relationship between service comprehensiveness and habit.
- The relationship between perceived usefulness and intention to use.
- The relationship between perceived usefulness and satisfaction.
- The relationship between satisfaction and habit.
- The relationship between habit and e-government continuance.

## 6.8 Exploratory relationship assessment

Our research model is built based on the expectation confirmation theory, with additional constructs based on the literature review. In the previous section, all the relationships based on the literature review were tested. In this section, we conducted an exploratory analysis of the total effect of the path co-efficient. According to Field

(2009), values of ±.1 represent a small effect, ±.3 is a medium effect and ±.5 is a large effect. Test results as in Figure 6.13 show the strength of these relationships.

As can be seen, there is a weak relationship between emotion and habit. Service quality has three relationships, all with medium effect. The first relationship is between service quality and perceived usefulness. The second relationship is between service quality and intention to use. The third relationship is between service quality and e-government continuance.

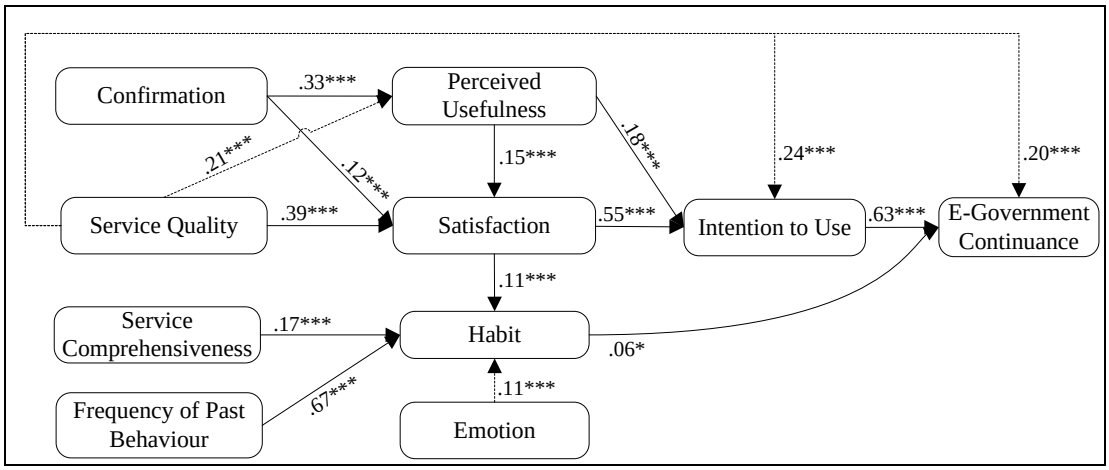


Figure 6.13 Exploratory relationship assessment model

## 6.9 Summary

This chapter reports the hypothesis testing results. This chapter starts with data editing, followed by the instrument validity and reliability tests. Then it showed the results of descriptive analysis on the survey participant demographics, and other factors that may affect the participants' actual use of e-government services. It presented the test of model fit. It presented the test of the structural model, including explaining the variance and path co-efficient test. It showed the hypothesis test and made an assessment of relationship strength. Finally, this chapter provided exploratory relationship assessment of the research model.

# CHAPTER 7: DISCUSSION

## 7.1 Introduction

This chapter discusses key findings of the quantitative survey research presented in the previous chapter. First, this chapter discusses the findings from the descriptive statistical analysis. Second, it reviews the research model and the role of each construct, in order to answer the research questions raised in this empirical research that is grounded in expectation confirmation theory. After that the chapter discusses the significance of research findings and contributions to the literature.

## 7.2 Findings from demographic analysis

This section discusses the findings on the online survey participants' demographics. The demographic information consisted of 6 items: age, level of education, primary uses of the Internet, frequency of the Internet use and length of stay in Australia. Most of the participants were males (82.3%). The highest number of participants belongs to the age group (25-29) years old, including 292 respondents (38.5%), followed by the youngest age group (20-24) years old, including 199 respondents (26.2%). The majority of respondents held a master's degree, with 292 respondents (38.5%), followed by a bachelor's degree level with 280 respondents (36.9%). This shows that most of the sample are highly educated citizens. The results indicated that the majority of the respondents were studying in Australia for three years, with 307 respondents (40.4%), followed by 141 (18.6%) of the respondents studying in Australia for two years.

With regard to their background information related to e-government services, the results indicated that the highest Internet use frequency, which is "a few times a day", was 723 (95.3%). Hence, our sample tends to be active and experienced users of the Internet. This percentage suggests clearly that almost all the respondents have the required experience to use e-government services. The results indicated that information searching was the highest use of the Internet with 729 (96%).

## 7.3 E-government use experience

The e-government use experience items asked the participant about MOHE e-services use. It consisted of 6 items: the preferred way to access government services, the preferred way if the participant faced any problem with government e-services, and the most used e-services from MOHE portal. Using e-government services is not always the preferred way for making government enquiries because it is voluntary. Saudi citizens have the option of using many government channels, such as using the e-services, the mail, the e-mail, face to face or using the telephone. Because this research attempts to understand continuance use of e-government, it is critical to find the preferred way or method for access to government services.

The results indicated that 388 of the respondents (51.1%) prefer using the MOHE Portal, with another 175 respondents (23.1%) preferring to use the e-mail for government services. Only 143 respondents (18.8%) prefer using mail for government services. However, using e-services is not always free from problems. Sometimes the users need some help from the government agency. Thus, when we asked the participants about the preferred method if they faced any problem, only 50 respondents (6.6%) would use the available technical support feature, and 370 of them (48.7%) would use the e-mail for seeking technical assistance.

Finally, we asked about preferred Ministry of Higher Education (MOHE) portal services. MOHE portal provides its e-services in four categories. The first category is "My information services". The services under this category related to all types of information update. The results indicated that the highest used service in this category is "edit academic data" with 305 respondents (40.2%).The second category is the personal services. The services under this category relate to many personal requests and enquiries. The results indicated that the highest e-service used by the respondents was "follow-up request", with 547 respondents (72.1%). The third category is financial services. The services of this category relate to financial requests. The results indicated that the highest used service in this category is "compensation request" with 465 respondents (61.3%). The forth category is academic services. The services under this category related to all academic requests.

The results indicated that the most used service is "general requests" with 362 respondents (47.7%).

## 7.4 A revised research model through SEM analysis

Figure 7.1 below shows a revised model of e-government continuance, after having conducted SEM analysis on the postulated paths among the model constructs.

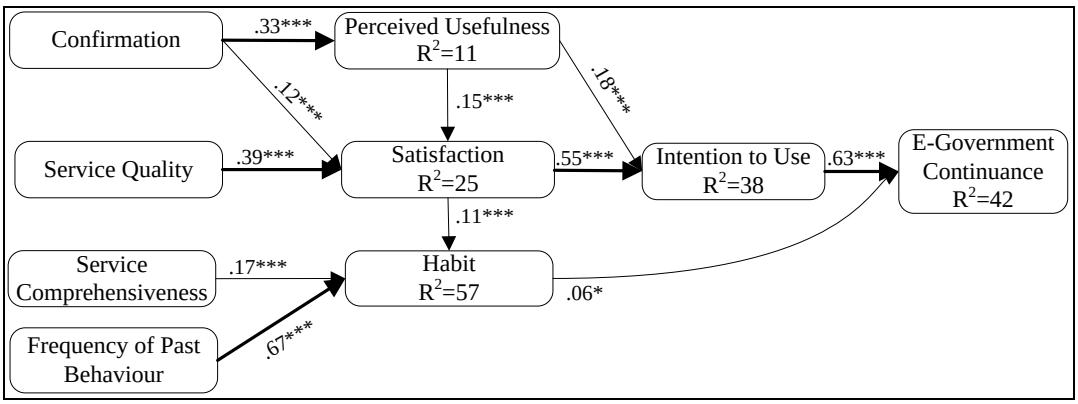


Figure 7.1 The final model showing supported relationships

Figure 7.1 shows the confirmed paths for the research model as found in this research. It shows that 42% of the variance of e-government continuance construct is explained by the model's antecedent constructs included in the model, which draws on the expectation confirmation theory and the IS continuance literature. In the IS research field, $R^2$ on IS continuance, as found in the top journals, tends to range from 24% (Limayem 2011) to 41% (Bhattacherjee 2001). Therefore, the $R^2$ value (0.42) found in this research is higher vis-a-vis those reported in the literature.

In this online survey research a total of 759 Saudi citizens have answered the four items in the e-government continuance scale, which aims to measure the citizen's decision or commitment to continue to use MOHE e-government services through the agency's Portal. In the literature on IS continuance, empirical research has focused on intention to use as the dependent variable (or the consequence) (Hung *et al.* 2013), with some notable exceptions which also studied continuance intention (Deng *et al.* 2010) and system use (Lean *et al.* 2009; Sykes *et al.* 2009). Therefore, this research has added the actual e-government users' decision or commitment to e-

government continuance in the research model. In order to further understand the SEM findings, we need to discuss the model relationships and highlight the roles of each of the proposed antecedents in influencing e-government continuance use.

To evaluate the model, it is necessary to test the model's ability to explain the variance in the dependant variables. Figure 7.1 shows $R^2$ values for all dependant variables. Intention to use and habit explained 42% of the variance of e-government continuance. Service comprehensiveness and frequency of past behaviour explained 57% of habit. Confirmation and service quality explained 25% of the variance of satisfaction. In addition, perceived usefulness and satisfaction explained 38% of the variance of intention to use. Finally, Only 11% of the variance in perceived usefulness was explained by confirmation.

The overarching aim of this study is to address the problem of low-level e-government continuance, which is grounded in expectation confirmation theory (Oliver, 1980). Based on an analysis of the literature, the two research questions have been raised and a set of the twelve hypotheses has been formulated in the research model. A SEM approach was adopted to test and validate the model using the large survey data.

## 7.5 The role of extended ECT on e-government continuance

Expectation confirmation theory (ECT) identifies the relationship between expectation, confirmation, satisfaction and intention to use. Expectation is represented by perceived usefulness in the context of IS continuance (Bhattacherjee 2001). The IS use literature and the IS continuance literature were used to identify additional antecedents likely to influence the e-government continuance use. In Wangpipatwong *et al.* (2009) the e-government continuance model proposes a relationship between service quality and satisfaction. In addition, DeLone and McLean (2002) and Kumar *et al.* (2007) proposed the same relationship between service quality and satisfaction in their models. Figure 7.2 below shows the extended ECT of the overall research model.

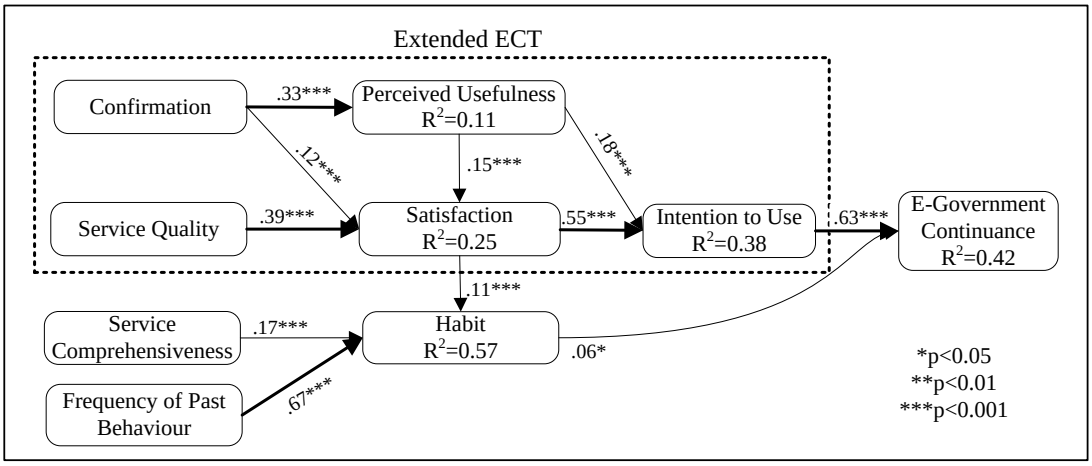


Figure 7.2 Extended ECT

### 7.5.1 Intention to use

My research model proposes that there is a direct and positive relationship between intention to use e-government services and e-government continuance use. This research confirms this assumption. Results indicate that intention to use has a positive and direct impact on e-government continuance. As Figure 7.2 above shows, this relationship is positive and significant with a path co-efficient equal to 0.63 ($p<0.001$). E-government users who have intention to use e-government services, are probably going to continue using e-government services.

In the literature, many studies have investigated the factors that influence the initial intention to use (Carter & Belanger 2004; Phang *et al.* 2005; Wangpipatwong *et al.* 2008). Based on the current literature, there are few studies on the continuance use of IS showing a strong relationship between intention to use and continuance use (Bhattacherjee 2001; Meng *et al.* 2004; Thong *et al.* 2006; Limayem *et al.* 2007; Hossain *et al.* 2009; Deng *et al.* 2010). Our findings are consistent with the previous literature. However, our findings are inconsistent with Limayem (2011). He found that the relationship between intention to use and IS continuance use is a weak relationship. This could be due to the big differences between the e-learning context in Limayem (2011) and the e-government context.

Based on our findings, the Saudi e-government officials should pay more attention to increasing the intention to use the e-government services. This can be achieved through focusing on the antecedents of the intention to use.

### 7.5.2 Satisfaction

In this research model, I proposed that there is a direct and positive relationship between satisfaction, and both intention to use and habit. My results confirm that there is a direct and positive relationship between satisfaction, and both intention to use and habit. As Figure 7.2 shows, perceived usefulness, confirmation and service quality explained 25% of the variances in satisfaction. It can be noted that satisfaction had a stronger impact on intention to use, with a path coefficient of 0.55 ($p<0.001$), than the impact it had on habit, with a path coefficient of 0.11 ($p<0.001$). In addition, satisfaction has an indirect and positive impact on e-government continuance through two paths. The first path is impacting e-government continuance indirectly through intention to use. We found that this path is very strong in all its parts (between satisfaction and intention with a path coefficient=0.55; between intention and e-government continuance with a path coefficient=0.63). The second path is impacting e-government continuance indirectly through habit. We found that this path is weak in all its parts (between satisfaction and habit with a path coefficient=0.11; between habit and e-government continuance with a path coefficient=0.06). Thus, more e-government user satisfaction will probably produce more intention to use e-government services and consequently more e-government continuance use. However, more user satisfaction will probably not form a habit of continually using e-government services.

In the information systems literature, the relationship between satisfaction and intention to use was usually studied as a part of ECT. In these studies, such as Bhattacherjee (2001); Meng *et al.* (2004); Thong *et al.* (2006); Limayem *et al.* (2007); Venkatesh and Goyal (2010), satisfaction always shows as a significant factor influencing the intention to use. In addition, Zhang *et al.* (2011) proposed this relationship in their model and they recommended further study. Our findings are consistent with these studies that show a strong influence of satisfaction on intention to use.

In addition, the relationship between habit and satisfaction has found only little attention in the IS literature (Karahanna *et al.* 1999; Limayem & Hirt 2003; Limayem *et al.* 2007). However, that relationship between satisfaction and habit has been found to be significant (Limayem *et al.* 2007). In addition, Chiu *et al.* (2012) found that satisfaction has a moderate strength on habit. My findings are inconsistent with the few available IS literature studies, because I found that the influence of satisfaction on habit is weak.

Prior research such as Welch *et al.* (2005) has shown some evidence for linking trust in government and satisfaction with e-government services. They found evidence for a direct positive relationship between use of e-government services and citizens' satisfaction with e-government, and an indirect relationship between satisfaction and trust in e-government. On the other hand, my thesis supports the hypothesis that satisfaction with e-government services positively effects continuance (continuing use) of e-government. It is very plausible that both findings may be right. It is a two-way interaction effect. On the one hand, use of e-government services as an antecedent is necessary for satisfaction with e-government (obviously, without use, no citizens can find out if services are satisfactory or not). On the other hand, satisfied citizens will continue to use e-government services and make the potential benefits of e-government services realized through continuance. These findings address the gap in the literature about whether or not the potential benefits of (or the potential public value of) e-government are fully realized (Norris & Reddick 2012).

Based on my findings, it is clear that the Saudi e-government officials should pay more attention to the role of satisfaction, because of its strong relationship to intention to use the Saudi e-government services. The relationship between intention to use and the quality of e-government is strong as well. Thus, the total effect of satisfaction on Saudi e-government continuance use is strong. This is true despite the weak relationship between satisfaction and habit. In other words, satisfied Saudi e-government users will probably continue using the e-government services.

### 7.5.3 Service quality

I proposed that there is a direct and positive relationship between service quality and satisfaction. My research found that service quality has a positive and direct impact on satisfaction. As Figure 7.2 shows, this positive relationship is considered strong with a path coefficient equal to 0.39 ($p<001$). The findings also revealed that service quality has a positive and indirect impact on e-government continuance use, through positively impacting satisfaction, which then positivity impacts intention to use. This path of positive and indirect relationship between service quality and e-government continuance use was found to be significant and strong. The total path is as following: The path co-efficient between service quality and satisfaction is 0.39 ($p<00.1$) and the path co-efficient between satisfaction and intention to use is 0.55 ($p<0.001$). Finally, the path co-efficient between intention to use and e-government continuance is 0.63 ($p<0.001$). Thus, attempts to improve the e-government service quality will positively increase citizens' satisfaction. When e-government users are provided with high quality e-government services, those users tend to be satisfied, which reflects on their intention to use e-government services, and continue using them.

In fact, as discussed in the literature review chapter, service quality construct in this research includes both information quality and system quality. Information quality is concerned with the measure of the information that the system produces and delivers (DeLone 1992), and the quality of information that a government needs to make available on its website (Wangpipatwong *et al.* 2005). System quality is concerned with the measure of the actual system which produces the output (DeLone 1992). System quality refers to the features and performance of e-government websites from the citizen's point of view, and to the quality in use of e-government websites (Wangpipatwong *et al.* 2005). Thus, based on our findings, in order to increase user satisfaction, e-government officials should pay more attention to both information quality such as information accuracy (free from errors), information timeliness (up-to-date) and system functionality (system works correctly and system provides necessary transactions). The greater the level of system quality or user satisfaction, the greater the level of use of the system (Seddon 1997).

These findings are consistent with Au *et al.* (2008) and Zheng *et al.* (2012) from the information systems context. In addition, these findings are consistent with Seddon (1997); Kumar *et al.* (2007) and Wangpipatwong *et al.* (2009) from the e-government context. Also, the findings are consistent with Tan *et al.* (2013) who found that both service content and delivery are found to be significant contributors to achieving e-government service quality. However, despite Kumar *et al.* (2007) showing the strong influence of service quality on satisfaction, that study did not cover all service quality aspects (information accuracy and system functionality). Wangpipatwong *et al.* (2009) is one of few studies in e-government that have a comprehensive view of service quality (information accuracy and system functionality). The results of that study are consistent with the results of this thesis.

Based on these findings, it is clear that the Saudi government officials should pay more attention to the service quality of the Saudi e-government services. The more the Saudi e-government services are high in quality (information and system quality), the more the users will be satisfied of using these services.

### 7.5.4 Confirmation

I proposed in my model, that there is a direct and positive relationship between both perceived usefulness and satisfaction. As Figure 7.2 shows, confirmation has a positive and significant impact on perceived usefulness with a path co-efficient equal to 0.33 ($p<0.001$). It also shows that confirmation has a positive and significant impact on satisfaction, with a path coefficient equal to 0.12 ($p<0.001$). My results indicated that confirmation has a medium and positive impact on perceived usefulness (path co-efficient=0.33) and a small, positive impact on satisfaction (path co-efficient=0.12). Confirmation has an indirect impact on e-government continuance through perceived usefulness influencing intention to use. This path is relatively weak because of the weak impact of perceived usefulness on intention to use (path co-efficient=0.18). Confirmation has also an indirect impact on e-government continuance through satisfaction influencing intention to use. This path is also relatively weak because of the weak impact of confirmation on satisfaction (path co-efficient=0.12). Thus, when citizens' expectations are confirmed, they are more likely to be satisfied and find the e-government service useful for them. This

satisfaction and perceived usefulness then positively influences the citizens' intention to use e-government services and consequently influences the e-government continuance.

The influence of confirmation on perceived usefulness is consistent with Bhattacherjee (2001); Thong *et al.* (2006); Limayem *et al.* (2007), from the context of information systems. The influence of confirmation on satisfaction is consistent with Meng *et al.* (2004); Thong *et al.* (2006); Limayem *et al.* (2007) from the context of information systems and information technology. So, this research is consistent with the role of confirmation in the information systems context. In one of the few studies in the e-government context, Hossain *et al.* (2009) examine the relationship between confirmation and both perceived usefulness and satisfaction. I have found that the result of my research is consistent with Hossain *et al.* (2009) from the e-government context.

Based on these research findings, it is clear that the Saudi e-government officials should pay more attention to the role of confirmation, because it improves the perceived usefulness of the Saudi e-government services. In addition, despite the weak relation between confirmation and satisfaction, Saudi e-government officials should not ignore the effect of confirmation on satisfaction because of the critical importance of satisfaction in the e-government user decision to continue using e-government services. Thus, confirming the Saudi e-government user expectations should be considered in order to improve the level of Saudi e-government continuance use.

### 7.5.5 Perceived usefulness

In my model, I proposed that there is a direct and positive relationship between perceived usefulness and both intention to use and satisfaction. My findings confirmed this relationship (see Figure 7.2 above). The findings also show that confirmation accounted for only 11% of the variance in perceived usefulness. The relationship between perceived usefulness and intention to use was found to be significant and positive, but weak, with a path co-efficient equal to 0.18 ($p<0.001$). The relationship between perceived usefulness and satisfaction was also found to be

significant and positive, but weak, with a path co-efficient equal to 0.15 ($p<0.001$). In addition, it was found that perceived usefulness has a positive and indirect impact on e-government continuance through two relationships. The first relationship is influencing e-government continuance indirectly through intention to use. The relationship between perceived usefulness and intention to use (path co-efficient 0.18, $p<0.001$) was found to be weak; however, a strong relationship was found between intention to use and e-government continuance (path co-efficient 0.63, $p<0.001$). The second relationship is impacting e-government continuance indirectly through satisfaction and intention to use. As stated previously, the relationship between intention to use and e-government continuance is strong (path co-efficient 0.63, $p<0.001$). Also, the relationship between satisfaction and intention to use is strong (path co-efficient 0.55, $p<0.001$). However, the relationship between perceived usefulness and satisfaction is weak (path co-efficient 0.15, $p<0.001$). Thus, it can be said that the total effect of the path of perceived usefulness on e-government continuance is weak.

As described in chapter 4, there are two streams in studying the relationship between perceived usefulness and intention to use. The first stream is studying this relationship as a part of the technology acceptance model (TAM) which was first brought to the literature by Davis (1989). In this stream, authors usually add different extensions to TAM, then test their models (Kim & Malhotra 2005; Kim & Son 2009). In the same stream, and in the context of e-government, there are many studies testing this relationship as part of TAM, showing a strong relationship between perceived usefulness and intention to use (Wangpipatwong *et al.* 2008; Hamner & Al-Qahtani 2009; Mahadeo 2009; Segovia *et al.* 2009; Stafford & Turan 2011).The findings of my thesis are inconsistent with the streams of studies. I found that the influence of perceived usefulness on intention to use is weak. The second stream studies the relationship between perceived usefulness and intention to use as a part of expectation confirmation theory (ECT). In this stream, there are many studies emphasizing the importance of this relationship (Bhattacherjee 2001; Thong *et al.* 2006; Limayem *et al.* 2007; Venkatesh & Goyal 2010). However, not all of those studies are in the context of e-government. They are in the information systems context. This thesis is inconsistent with those studies. I found that the influence of

perceived usefulness on satisfaction is weak. Thus, this thesis under-emphasizes the importance of this relationship.

The relationship between perceived usefulness and satisfaction has usually been studied as a part of ECT in the information systems literature. Many studies show a significant influence from perceived usefulness towards satisfaction (Bhattacherjee 2001; Thong *et al.* 2006; Limayem *et al.* 2007; Hossain *et al.* 2009). However, not all of those studies were in the e-government context. This thesis found that the influence of perceived usefulness on satisfaction is weak.

Based on these findings, it is clear that the Saudi government officials should pay less attention to the perceived usefulness of the Saudi e-government services. However, perceived usefulness is still playing an important role in the continuance use of the Saudi e-government services, but with less importance than satisfaction and intention to use.

### 7.6 The role of habit on e-government continuance

This thesis proposed that there is a direct and positive relationship between habit and e-government continuance use. The research conducted confirms this relationship. The results indicated that the relationship between habit and e-government continuance is positive and significant, with a path co-efficient equal to 0.06 ($p<0.05$). This relationship is considered very weak. Thus, attempts to improve the e-government continuance through forming a habit of using e-government services is not suggested. As in Figure 7.3 below, service comprehensiveness and frequency of past behaviour are explaining 57% of the variance in habit.

Most of the information systems literature focuses only on the intention to use, and ignores habit as an important driver for the behaviour (Limayem *et al.* 2007). Ortiz de Guinea and Markus (2009) call for empirical research to investigate the relationship between habit and the continuing information systems use. Limayem *et al.* (2007) is one of the early and few studies that empirically tested this relationship. My findings are consistent with that study, which found that habit has a weak

relationship with e-government continuance. Forming a using habit will probably not increase e-government continuance. However, in the context of online shopping, Chiu *et al.* (2012) found that forming a habit will affect repurchase behaviour strongly. Thus, my findings are inconsistent with Chiu *et al.* (2012). This could be due to the major differences between the e-government context and the online shopping context.

Teerling and Pieterson (2011) claim that citizens are not driven by a rational assessment of what channel to use for what purpose, but habits do appear to be an important factor. In addition, citizens do not automatically switch to the digital channels, as they are accustomed to the traditional channels. Although habitual behaviour has positive aspects, such as the reduction in cognitive load, there are reasons why this behaviour is undesirable. First, a citizen choosing the front desk out of habit may spend time and money going to the town hall, while not benefitting from the same service from behind his computer. Therefore, citizens might benefit from a behavioural change in their direct interest.

Based on my findings, it is clear that the Saudi e-government officials should pay less attention to the forming of habit when using the Saudi e-government services. However, the relationship between habit and behaviour continuance can be strong in different contexts, such as online shopping.

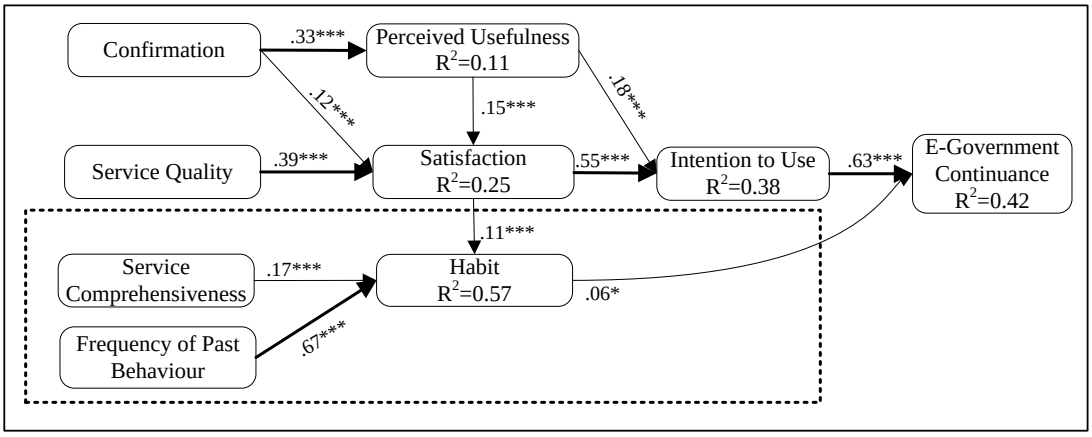


Figure 7.3 The role of habit on e-government continuance

### 7.6.1 Service comprehensiveness

Service comprehensiveness means providing all the required and different services to the users of the e-government to be able to achieve their tasks. I proposes in the model that there is a direct and positive relationship between service comprehensiveness and habit. This hypothesis is confirmed. Research results indicated that the relationship between service comprehensiveness and habit is considered positive and significant, with a path co-efficient equal to 0.17 ($p<0.001$) (see Figure 7.3). However, the positive impact of service comprehensiveness on habit was found to be weak (path co-efficient= 0.17). Service comprehensiveness has an indirect and positive relationship with e-government continuance through habit. The total path of this relationship is weak. These findings are consistent with Limayem *et al.* (2007); Chiu *et al.* (2012) from an information systems context. However, there are no studies exploring the relationship between service comprehensiveness and habit in the e-government context. I found that service comprehensiveness had a weak influence on forming habit to continually use e-government services.

In the case of Saudi e-government, having all the needed e-government services will have a weak influence on the forming of a habit to continually use the Saudi e-government services. However, despite the weak relationship between service comprehensiveness and habit, providing all the required and different services to the users of the Saudi e-government is very important. That is because not being able to find the needed e-government services may affect the usefulness of the e-government.

### 7.6.2 Frequency of past behaviour

I proposed in the model that there is a direct and positive relationship between frequency of past behavior and habit. This relationship has been confirmed. Frequency of past behavior has a positive and significant impact on habit with a path co-efficient equal to 0.67 ($p<0.001$). The more citizens use e-government services, the more they are more likely to form a habit of using e-government services. Based on my results, this relationship is considered strong. As in Figure 7.3, there is an indirect impact of frequency of past behavior on e-government continuance through

habit. The relationship between frequency of past behavior and habit was found to be very strong (path co-efficient=0.67); however, a weak relationship between habit and e-government continuance was found (path co-efficient=0.06). These findings are inconsistent with Limayem *et al.* (2007) in the IS context because they found that the relationship between frequency of past behavior and habit is very weak. There are many studies exploring habit forming antecedents, such as Jasperson *et al.* (2005); Gardner *et al.* (2012); Nilsen *et al.* (2012); Rühle *et al.* (2012); Venkatesh *et al.* (2012); Olsen *et al.* (2013). It is worth mentioning that Limayem *et al.* (2007) from an IS context, and this thesis, from an e-government context, are the only two empirical researches that separate each habit's antecedents in construct, and test each solely. Most habit studies just study habit by itself and ignore its antecedents. However, my research, and the research of Limayem *et al.* (2007), are inconsistent in their findings about the relationship between frequency of past behavior and habit.

It is clear that the Saudi e-government officials should pay more attention to the role of frequency of past behavior on forming the habit of using the Saudi e-government services. The more the Saudi e-government services are used, the more the users will form the habit of using these services.

## 7.7 Saudi e-government performance

As discussed in this chapter, the research model was tested and validated through SEM path analyses. The research also aimed to examine the model's implications through an analysis of Saudi e-government performance over time. While Saudi Arabia is a developing nation in the Middle East, Saudi e-government development has demonstrated a remarkable progress against other nations. On the basis of its e-government development index value, the *2012 United Nations E-Government Survey Report* ranked Saudi e-government development as 41$^{st}$ in global ranking. Furthermore, the United Nations specifically identified Saudi Arabia as one of the emerging e-government leaders, behind the top developed nations such as Australia (United Nations 2012).

However, despite the remarkable progress by the Saudi government in developing e-government services, there is a noticeable low level of continuance use of these e-government services. Thus, governments should consider the importance of citizen's awareness of e-government websites and look into the significant factors influencing citizen's continuance intention to use e-government websites (Wangpipatwong *et al.* 2008). In addition, there is a lack of studies that empirically investigate the continued use of e-government. Continuing use of e-government contributes to e-government service sustainability (Detlor *et al.* 2013). The success of the Saudi e-government depends on the willingness of the e-government users to continue to use these e-services whether they are citizens, businesses, employees, or other government agencies. The continued use of e-government services will make a strong contribution towards reaping a return on the funds invested in the Saudi e-government projects. Hence, as indicated in chapter one, the main goal of this research is to gain a better understanding of the e-government continuance use antecedents, and how strongly these antecedents influence each other. Studying these antecedents will improve the likelihood of increasing the level of e-government continuance use.

While this survey research did not analyse the performance of e-services provided by the Ministry of Higher Education portal, we can assess the performance of the entire Saudi e-government by performing a comparative analysis of secondary data sources on e-government performance that are available. The United Nations' Annual E-Government Survey publishes a global ranking of national e-governments among its member nations, based on an e-government readiness index. The e-government readiness index is a composite weighted average score derived from three measurements: online service index, telecommunication index and human capital index. The global ranking of 1st represents the best e-government performance worldwide. Figure 7.4 shows a time series of Saudi Arabian e-government global rankings over the period of 2003 to 2012 vis-à-vis those of the top two e-government nations in the Middle East: United Arab Emirates (UAE) and Bahrain. In 2003 the UAE globally ranked 38th among the UN member nations, which was followed by Bahrain's 46th and Saudi Arabia lagging behind at 105th. Saudi Arabia's e-government implementation was ranked 90th in 2004, 80th in 2005, 70th in 2008,

and 58th in 2010, and 41st in 2012 respectively. The difference in its relative global ranking between 2003 and 2012 is a positive value of 64, which is a large gain globally, showing strong evidence for the Saudi Arabian e-government performance improvement, relative to that of other national e-governments.

Based on the comparative analysis, it is clear that Saudi Arabia's e-government services at the national level have been steadily improving over time (United Nations 2003; United Nations 2008; Chatfield & Al Hujran 2009; United Nations 2010). This thesis also argues that the Saudi Arabian government's capability to close the gap with the top two e-government nations in the Middle East, can be attributed to its 2006 launch of the national portal, Saudi, which was discussed earlier. It may also be attributed to the e-government inter-operability governance structure and the strategic framework for inter-operability, although these were not discussed in detail in this thesis.

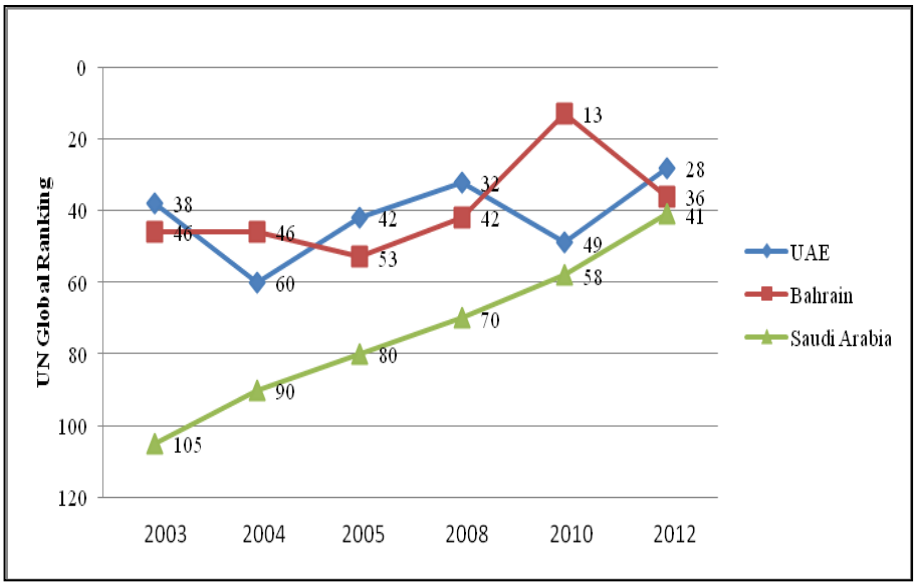


Figure 7.4 Top Middle East nations for E-government readiness global ranking (source: UN E-government Survey 2003-2012)

Saudi Arabia's e-government performance can be also evaluated by the number of unique visitors, the number of total visitors, and the average time spent at the National Portal. The number of unique visitors to the National Portal does not count those who visit the National Portal more than once with their multiple visits. The

only available secondary source data are from 2011. Table 7.1 shows a trend analysis of three measurements in 2011. Overall, the three measurements show a positive trend.

Table 7.1 A trend analysis of the number of unique visitors to the National Portal

| Month | January 2011 | February 2011 | March 2011 | April 2011 |
|---|---|---|---|---|
| Number of unique visitors | 338,846 | 312,808 | 558,030 | 346,466 |
| Number of total visitors | 1,638,563 | 1,397,800 | 2,947,663 | 1,690,701 |
| Average time spent at the National Portal | 6 minutes 50 seconds | 6 minutes 34 seconds | 6 minutes 51 seconds | 6 minutes 54 seconds |

Saudi Arabia's e-government performance can be further evaluated by citizens who participated in the Polls on "Saudi". "Saudi" publishes periodically a series of opinion polls, as the national government attempts to understand user perspectives on the ease of use of the National Portal in general, and that of e-government service transactions in particular. The latest poll published results from 500 citizens on "Saudi" during the period of June 4-June 18, 2011. The question asked was:"How do you rate ease of use of the National Portal?" Slightly more than half of the respondents found it either very easy or average, in terms of the ease of use. However, despite the public administration's innovations to improve the transparency in public e-services and the accessibility through the National Portal, forty eight percent of the users still find some difficulty in using the Portal.

In addition, Saudi Arabia's e-government performance can also be evaluated through its progress towards open government. Based on research by Alanazi and Chatfield (2012), there are countries in the Middle East such as Kuwait, Oman, and Israel which have made progress towards open government, for example, through participation in the Open Government Partnership. However, with regard to actual implementation, it was found that only three countries have made government-owned data public: United Arab Emirates (UAE), Bahrain, and Saudi Arabia. Table 7.2 below shows the findings of the website survey analysis of the thirteen countries. The findings are consistent with the 2011 World Economic Forum Report, which has

identified these three countries in the Gulf Cooperation Council (GCC) region as having adopted a holistic approach to developing their action plans, and having achieved some tangible outcomes, however with various degrees of success (World Economic Forum 2011). According to their Arabic e-government websites/portals, Bahrain, UAE and Saudi Arabia consider open data as an essential means for promoting government transparency and facilitating public participation and engagement with the government. For example, the UAE government states that in addition to enabling citizen engagement, open data will increase not only government transparency, but also the overall public value the government creates and delivers to its citizens (United Arab Emirates Portal 2012).

Table 7.2 Open data in Middle East

| Country | Open Data |
|---|---|
| **Saudi Arabia** | **Yes** |
| Kuwait | No |
| **Bahrain** | **Yes** |
| Qatar | No |
| **UAE** | **Yes** |
| Oman | No |
| Jordan | No |
| Israel | No |
| Iran | No |
| Syria | No |
| Yemen | No |
| Lebanon | No |
| Iraq | No |

Through website analysis, it was also found that the three countries had used different strategies in implementing open data. On the one hand, both UAE and Saudi Arabia have made their data public using a direct link from the main e-government portal. They have dedicated sections for open data within their national e-government portals. While the UAE portal offers a convenient way of finding certain open data by providing a search tool to search for specific information, the only way to find data of interest through the 'Saudi' e-government portal is to browse through all the listed information.

The 'Saudi Open Data' consists of documents and spreadsheet files that contain government statistics, policies, reports, and case studies that are collected from all

the government agencies and ministries. On the other hand, Bahrain developed a dedicated website called the 'Open Data Platform' – an important initiative for Bahrain, which is very similar in concept to the US open data platform, "data.gov" – for making government-owned data public. Bahrain's Open Data Platform aims to enhance government transparency by implementing a public data hub (Open Data Platform 2012). The main goal of the Open Data Platform is to publish datasets owned by ministries and government agencies and make these data available to the public. Bahrain's Open Data Platform also provides a mechanism for promoting public feedback on open data, as well as providing the public with guidelines on how the data platform can be used.

## 7.8 Summary

This chapter discussed the quantitative survey research results presented in the previous chapter. This chapter first reviewed the research model and the role of each construct. The chapter then answered the research questions. After that the chapter discussed the Saudi e-government performance.

# CHAPTER 8: CONCLUSION

## 8.1 Introduction

The previous chapter highlighted the key findings of this survey research and answered the research questions. It also presented an analysis of Saudi e-government performance as a proxy for testing the underlying assumptions of the research model; that is, e-government continuance by citizens will require the provision of integrated informational and transactional e-services on the part of the government (supply-side). This concluding chapter presents an overview of the research, followed by the research contributions to the e-government and IS literature. It will also discuss limitations of this research and future research directions.

## 8.2 Overview of the research

Electronic government (or e-government) aims to provide comprehensive and timely public services to citizens through the adoption, use and management of information and communication technologies (ICTs) in government. In this thesis I argue that e-government benefits realization, therefore, critically depends on citizens' satisfactory experience and continuing use of e-government services. Despite the rapid growth in e-government research and practice, problems of low-level e-government use, especially more advanced transactional services, have not been systematically studied in the e-government research literature.

To fill this gap, this empirical survey research, grounded in Oliver's (1980) expectation confirmation theory and IS continuance literature, aims to develop a better theoretical explanation for the problem of low-level e-government use. This research has developed a new research model for citizen continuance of e-government services. Results provide strong evidence for statistically highly significant positive correlations among service quality, user satisfaction, intention to use, and actual continuance of e-government services. While statistically significant, habit is not found to be strongly associated with e-government continuance. The research findings have public policy implications. Government needs to pay greater attention to e-service governance and strategic management of both government

supply-side (quality of e-government services to citizens) and citizen demand-side (intention to use, and satisfaction with, e-government services) which are both technological and organizational policy issues, in order to enhance and sustain citizens' continuing use of e-government services for greater e-government benefits realization.

## 8.3 Research contribution

Theoretical contributions: The research model developed in this thesis is grounded in ECT and the revised research model explains 46% of the variance of e-government continuance (behavioural intention). This means that the explanatory power of ECT has been shown, and its use is very promising for e-government continuance research. This research contributes to the knowledge by providing a comprehensive theoretical model of e-government continuance use. The research model was built on the expectation confirmation theory and was extended by introducing additional constructs and relationships. The additional constructs have never been empirically tested under the e-government context. In the future, e-government scholars may use this research model as a base for their studies. This research is one of the earliest researches that empirically tested the relation between two psychological constructs (habit and emotion) and their influence on use of e-government. The model of this research can be a solid base to understand technology user behaviour.

Many authors have investigated the direct impact of confirmation on satisfaction (Meng *et al.* 2004; Venkatesh & Goyal 2010; Zhang *et al.* 2011), however, fewer have studied the relationship between confirmation and perceived usefulness. Bhattacherjee (2001); Thong *et al.* (2006); Limayem *et al.* (2007) are among those who have studied this relationship, but their studies were not in the e-government context. Hossain *et al.* (2009) has studied this relationship in the context of e-government. This study showed that confirmation directly impacted perceived usefulness significantly.

Methodological contributions: This research has adopted SEM path analyses to test the initial research model. While SEM has increasingly been used in the IS research field, it has not been widely adopted and used in the e-government research field.

Empirical contributions: The overarching aim of this research was to shed some light on the known problem of low-level use of e-government services, especially transactional e-services, among citizens. Through a large-scale online survey this research has collected 846 questionnaires from Saudi citizens studying in Australia, and presented some strong empirical evidence for the hypothesized relationships in explaining e-government continuance.

Contribution to the Saudi government: While there have been many studies that have analysed e-government in Saudi Arabia, this research is considered to be the first of its type because it concentrates on the Saudi e-government user behaviour and the provider, who is the Saudi government. All the existing Saudi e-government researches focus mainly on the provider side, and ignores the demand side, which is the e-government users.

## 8.4 Research limitations

Although a sample size was large, an online survey through Survey Monkey does not conform to the statistical random sampling norm. Moreover, the survey participants are Saudi citizens, who tend to be well educated. Finally, while Saudi Arabia still is a developing country, its e-government development is very advanced in providing citizens with sophisticated transactional e-services which are very well-integrated across government agencies. So, the findings from this empirical study may not be generalizable to other developing countries. However, the key findings from this research from an ECT perspective can inform e-government researchers and e-government policy makers in those countries in which citizens are in general well-educated, and have financial and human resources for developing advanced e-government services. This research explored the research questions only in the context of transactional e-government services provided by Saudi Arabia's Ministry of Higher Education (MOHE) portal.

Another limitation is that all participants are overseas students. However, they represent almost all Saudi citizens because some of them work for the government, others for the private sector and others are unemployed.

Moreover, despite the use of the MOHE portal being not mandatory for the participants, they might be influenced to use MOHE portal because it is the easiest way to make their enquiries in a big country like Australia.

Despite these limitations, this research study provides important insights into the factors that affect the Saudi citizens in order to continue use of e-government services. Listing the limitations in this study has helped to provide suggestions for future research.

## 8.5 Research implications

This empirical research on e-government continuance has timely and important implications, not only for the IS research community, but also for practice and theory for improving public services and value creation from e-government development. The choice of Saudi e-government services is strategic, because the author has access to information resources (some in Arabic) needed for the research questions. While Saudi Arabia is a developing nation in the Middle East, Saudi e-government development has demonstrated remarkable progress against other nations. On the basis of its e-government development index value, the *2012 United Nations E-Government Survey Report* ranked Saudi e-government development as 41$^{st}$ in global ranking. The United Nations specifically identified Saudi Arabia as one of the emerging e-government leaders, behind the top developed nations such as Australia.

Moreover, in a recent study of 13 Middle East nations on participatory 'open data' policy implementation, it was found that Bahrain, United Arab Emirates, and Saudi Arabia were the only three nations which developed a dedicated 'open data' website to share government-owned data with the public (Alanazi & Chatfield 2012). Therefore, it is hoped that key findings from this empirical research will benefit not

only the Saudi Arabian government, but also other nations with substantial investment in e-government development initiatives for improving public services.

This research examined the many antecedents influencing citizens' e-government continuance use. This research highlighted the influence of these antecedents on how the Saudi citizens use the e-government services.

This research provides Saudi e-government officials and policy makers with important guidelines in understanding how different antecedents affect Saudi citizens' use of e-government. These guidelines are critically important for any e-government project.

Since the Saudi government and many other governments face the problem of a low level of e-government use (Aichholzer 2004; Wang 2009; Pavilenene 2011; Teerling & Pieterson 2011; United Nations 2012), it is hoped that these research results will support e-government officials in increasing the level of e-government continuance use.

The results of the survey show that frequency of past behaviour, satisfaction, and intention to use contributes significantly to citizen continuance use of e-government. Thus, the e-government officials should pay more attention to these antecedents in order to increase the level of e-government use.

## 8.6 Future directions

It is hoped and believed that the results of this research will assist the Saudi Arabian e-government. However, this research can be used to assist other countries with similar characteristics across key variables in e-government projects. If similar research was conducted on different countries that have characteristics similar to Saudi Arabia, the findings of that research might be compared to the result of this research, to affirm or extend it's results. Another possible future research direction might be to include a new survey that measures the effect of "trust in government" on "satisfaction" with e-government services.

This research model was used to test the continuance use of e-government. However, scholars can use this model to test the continuance use of other web-based services such E-bay, Facebook and general ICT services.

## 8.7 Concluding remarks

Despite the limitations of this study, a significant contribution has been made to e-government use research. In order to fully understand the e-government use, this research investigated a combination of many factors based on the IS continuance literature. This research combined all the factors that showed strong statistically relations. The result of this research can serve as a foundation for future research on e-government use. In addition, the results of this research may be used as a guide for new e-government projects planning and designing, because this research studies the supply side of the e-government. The results of this research showed the importance of the e-government continuance use in Saudi Arabia and these results can be used by any other country with similar characteristics.

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## APPENDIX A: CONSENT FORM FOR RESEARCH PARTICIPANTS ENGLISH VERSION

University of Wollongong

# Consent Form for Research Participants

**Understanding E-Government Continuance: A Conceptual Model of Transaction E-government Continuance for Public Value Co-creation**

Researcher: Jazem Alanazi

I have been given information about "*Understanding E- Government Continuance: A Conceptual Model of Transaction E-government Continuance for Public Value C-creation*". I understand that this research project is conducted by Jazem Alanazi as part of a PhD degree supervised by Dr. Akemi Chatfield from the Faculty of Information Systems and Technology at the University of Wollongong.

I understand that if I consent to participate in this study, I will be asked to complete an online survey on my actual use experience with regard to various e-services delivered by the Saudi Ministry of Higher Education and through its e-government portal. I also understand that my contribution will be confidential and that there will be no personal identification in the data that I agree to allow to be used in the study. Furthermore, I understand that there are no potential risks or burdens associated with this study.

I have agreed to provide an electronic copy of my answers to the survey for retention for the purposes of the study, which will be stripped of personal identifiers and coded by the researcher to any analysis. I have had an opportunity to email Jazem Alanazi to ask any questions I may have about the research and my participation. I understand that my participation in this research is voluntary and I am free to refuse to participate and I am free to withdraw from the research at anytime. My refusal to participate or withdrawal of consent will not affect my study in Australia.

If I have any enquires about the research, I can contact Jazem Alanazi (jmra722@uowmail.edu.au) and/or Dr. Akemi Chatfield (akemi@uowmail.edu.au). If I have any concerns or complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer, Human Research Ethics Committee, University of Wollongong on +6142214457.

By signing below I am indicating my consent to participate in the research. I understand that the data collected from my participation will be used primarily for a PhD thesis, and will also may be used in summary form for journal publication, and I consent for it to be used in that manner.

SignedDate

..... ...../...../.....

Name (please print)

.....

## APPENDIX B: PARTICIPATION INFORMATION SHEET ENGLISH VERSION

University of Wollongong

## Participation Information sheet for Saudi users of the Ministry of Education E-Services

Dear the online survey participant,

Thank you for taking the time to participate in this survey. This is an invitation for you to participate in a research study I am conducting as part of my doctoral thesis under the supervision of Dr. Akemi Chatfield of University of Wollongong. My research is concerned with continuing use of Web-based e-services and its potential benefits to both public-sector service delivery performance and users of e-services. Your participation is invaluable to our understanding of this important topic.

**Investigators**
Jazem Alanazi
Faculty of information systems and technology

Dr. Akemi Chatfield
Faculty of information systems and technology

**Purpose:** I am conducting a survey as partial fulfillment of requirements for the degree of Doctor of Philosophy in Information systems and Technology at the University of Wollongong, Australia under the supervision of Dr. Akemi Chatfield. The University website is www.uow.edu.au. My doctoral research aims to determine the factors that influence using e government continually in Saudi Arabia and its potential benefits to both public-sector service delivery performance and users of e-services. It is hoped that the results of this study will facilitate Saudi government to increase its online services performance and to expose unseen problems.

**Description**: The survey will take about 30 minutes to complete. The survey will seek your opinion about using the Saudi Ministry of Higher Education Portal. Also, it will ask some background information about you such as age, gender, education and computer experience. In return for your participation in this study, please email Jazem Alanazi at jmra722@uowmail.edu.au or Dr. Akemi Chatfield at akemi@uowmail.edu.au if you would like to receive a copy of the conclusion of the study. Your opinion and participation is extremely valuable.

**Confidential:** The success of this survey depends on your participation and candid responses. I would therefore greatly appreciate your assistance in answering the questionnaire. Please be assured that your responses will be kept strictly confidential. Individual participation will not be identified in the analyses as only aggregated results will be analyzed and presented.

**Complaints:** If you have any complaints about the conduct of the study, then please do not hesitate to contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong, Wollongong NSW 2522, Australia. Telephone: +61 242214457.

Thank you in anticipation of your involvement.

Yours sincerely,

Jazem Alanazi and Dr. Akemi Chatfield

## APPENDIX C: THE RESEARCH COVER LETTER AND THE SURVEY ENGLISH VERSION

Dear the Saudi student,

I am a Saudi citizen and a PhD candidate who is conducting this survey research as partial fulfilment of requirements for the degree of Doctor of Philosophy in Information Systems and Technology at the University of Wollongong, Australia.
Electronic government (or egovernment)
is "the use of information and technology to support and improve public
policies and government operations, engage citizens, and provide comprehensive and timely government services".
Leveraging the Internet and Web 2.0 technologies, egovernment
services are increasingly accessible to citizens
anywhere and anytime. However, little has been written about citizens' sustained use (or continuous use) of egovernment
services over a period of time. Therefore, this research aims to identify key factors that would influence
citizens' continuous use of egovernment
services by surveying Saudi students studying in Australia to learn how
they actually use the Ministry of Higher Education (MOHE) Portal eservices.
Your participation in this online survey is very important for this research project, because the survey findings would increase our knowledge and understanding of how egovernment
services can be improved and make a positive
difference to citizens and other stakeholders of the government.
There is no right or wrong answer. Please answer all questions. What matters to us is your honest views and opinions on the MOHE eservice
use experience.

Thank you for taking the time to complete this survey.

Best regards,

Jazem Alanazi, B.S. (Computer Science) & M.S. (ICT)
Ph.D. candidate
School of Information Systems and Technology
University of Wollongong

Please choose the most appropriate answer for the following items:

**1. Gender(sex):**

◯ Male ◯ Female

**2. How old are you?**

I am

**3. What is your last completed education degree?**

◯ High school
◯ Diploma
◯ Bachelor's degree
◯ Master's degree
◯ Doctoral degree

**4. What are your primary uses of the Internet?(Choose as many as you want).**

☐ Information searching.
☐ Browsing and/or surfing.
☐ Shopping.
☐ Email.
☐ Social media or social networking.
☐ Reading online news/magazines.
☐ Financial services/online banking.

Other (please specify)

**5. How often do you use the Internet?**

◯ Once a month
◯ A few times a month
◯ Once a week
◯ A few times a week
◯ Once a day
◯ A few times a day

**6. How long have you been studying in Australia?**

◯ Less than 1 year
◯ 1 year
◯ 2 years
◯ 3 years
◯ 4 years
◯ 5 years
◯ More than 5 years

**7. I prefer the following way if I need a government service.**

◯ Using the Portal ◯ Email ◯ Mail ◯ Face to face ◯ Phone call

**8. If I face a problem with any government e-service, I choose to use the following method.**

◯ Using the Portal ◯ Email ◯ Mail ◯ Face to face ◯ Phone call

**9. Which of "My Information Services" did you use the most?(Please select one best choice).**

◯ Edit personal data
◯ Edit academic data
◯ Edit contacting information
◯ Edit dependents data
◯ Edit qualification data
◯ Academic reports
◯ Change passport info
◯ Electronic file update

**10. Which of "Personal Services" did you use the most?(Please select one best choice).**

◯ Followup requests
◯ Alerts service
◯ Ticket booking order
◯ Enquiries
◯ Request a reward excellence
◯ Adding dependents to scholarship
◯ Annual Leave
◯ Acquainting Request

**11. Which of "Financial Services" did you use the most?(Choose as many as you want).**

◯ Statement of account ◯ Edit Bank Account Data ◯ Request for financial guarantee ◯ Compensation Request

**12. Which of "Academic Services" did you use the most?(Please select one best choice).**

◯ Degree Upgrading
◯ Trips and academic conferences
◯ Extending Scholarship
◯ Changing University
◯ Change Major
◯ Postponing the Scholarship
◯ Scholarship Termination
◯ Request training courses
◯ General requests
◯ Request a scientific trip
◯ Language study continuation
◯ Changing the Scholarship Country
◯ Modify scholarship starting date
◯ Modify scholarship finishing date
◯ Open a file for student dependent
◯ Changing the language institute
◯ Request for scientific movement
◯ Changing university & major

**13. In the last 3 months, how often did you access the Ministry of Higher Education (MOHE) Portal?**

- ◯ About once.
- ◯ About twice.
- ◯ Three times.
- ◯ Four times.
- ◯ Five times.
- ◯ Six times.
- ◯ Seven times and more.

**14. Approximately, how many times did you on average visit the MOHE Portal in the last 3 months?**

- ◯ About once.
- ◯ About twice.
- ◯ Three times.
- ◯ Four times.
- ◯ Five times.
- ◯ Six times.
- ◯ Seven times and more.

**15. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| I intend to use the MOHE Portal rather than using any alternative way. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| I intend to use the MOHE Portal rather than discontinue its use. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Overall, I plan to use the MOHE Portal. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

**16. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| I will continue using the MOHE Portal the next time I want to do business with MOHE. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| I intend to keep using the MOHE Portal. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Being able to continuously use MOHE Portal is very important to me. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| I am committed to keep using MOHE Portal. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

**17. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| I am pleased with the overall use of the MOHE Portal. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| I feel satisfied about my overall experience of using the MOHE Portal. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Overall, I am satisfied with Saudi e-government services which include other government Portals besides the MOHE Portal. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

**18. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| I am happy whenever I use the MOHE Portal. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Using the MOHE Portal gives me pleasure. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| When I think that I am going to use the MOHE Portal I feel angry. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| The idea of using the MOHE Portal makes me feel depressed. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| I feel frustrated when I am going to use the MOHE Portal. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

**19. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| Using MOHE Portal has become automatic to me. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Using the MOHE Portal is natural to me. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| When I have an inquiry, the MOHE Portal is an obvious choice for me. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

**20. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| Using MOHE Portal would enable me to complete tasks more efficiently. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Using MOHE Portal would increase my productivity on the tasks. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Using MOHE Portal would enhance my effectiveness on the tasks. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Using the MOHE Portal would make it easier to do tasks. | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

**21. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| I find all the services that I need in the MOHE Portal. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The MOHE Portal provides all required services for Saudi students. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**22. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| My experience with using the MOHE Portal was better than what I expected. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The service level provided by the MOHE Portal was better than what I expected. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Overall, most of my expectations from using the MOHE Portal were confirmed. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**23. Please rate how strongly you agree or disagree with each of the following statements:**

| | Strongly disagree | Disagree | Slightly disagree | Neutral | Slightly agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| Information on the MOHE Portal is accurate. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Information on the MOHE Portal is up-to-date. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The MOHE Portal always works properly without service disruption or down-time. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The MOHE Portal enables me to complete all necessary transactions online. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## APPENDIX D: THE ETHICS COMMITEE APPROVAL

University of Wollongong

**INITIAL APPLICATION APPROVAL**
**In reply please quote: HE11/390**
Further Enquiries Phone: 4221 3386
GH:CJ

25 November 2011

Mr Jazem Alanazi

Dear Mr Alanazi

Thank you for your response dated 22 November 2011 to the HREC review of the application detailed below. I am pleased to advise that the application has been **approved**.

| | |
|---|---|
| Ethics Number: | HE11/390 |
| Project Title: | Understanding E-Government Continuance: A Conceptual Model of Transactional E-Government Continuance for public Value Co-creation |
| Researchers: | Mr Jazem Alanazi, Dr Akemi Chatfield |
| Approval Date: | 23 November 2011 |
| Expiry Date: | 22 November 2012 |

The University of Wollongong/Illawarra Shoalhaven Local Health District Social Sciences HREC is constituted and functions in accordance with the NHMRC *National Statement on Ethical Conduct in Human Research.* The HREC has reviewed the research proposal for compliance with the *National Statement* and approval of this project is conditional upon your continuing compliance with this document.

A condition of approval by the HREC is the submission of a progress report annually and a final report on completion of your project. The progress report template is available at http://www.uow.edu.au/research/rso/ethics/UOW009385.html. This report must be completed, signed by the appropriate Head of School, and returned to the Research Services Office prior to the expiry date.

As evidence of continuing compliance, the Human Research Ethics Committee also requires that researchers immediately report:

- proposed changes to the protocol including changes to investigators involved
- serious or unexpected adverse effects on participants
- unforseen events that might affect continued ethical acceptability of the project.

**Research Services Office** University of Wollongong NSW 2522 Australia
**Telephone:** +61 2 4221 3386 **Facsimile:** +61 2 4221 4338
research-services@uow.edu.au www.uow.edu.au/research

Please note that approvals are granted for a twelve month period. Further extension will be considered on receipt of a progress report prior to expiry date.

If you have any queries regarding the HREC review process, please contact the Ethics Unit on phone 4221 3386 or email rso-ethics@uow.edu.au.

Yours sincerely

A/Professor Garry Hoban
**Chair, Social Sciences**
**Human Research Ethics Committee**

Cc Dr Akemi Chatfield, SISAT/Faculty of Informatics, Bldg 39.225

## APPENDIX E: THE RESEARCH COVER LETTER AND THE SURVEY ARABIC VERSION

عزيزي الطالب السعودي،

أنا مواطن سعودي و مرشح للحصول على الدكتوراة أجري هذه الأستبانة كمتطلب رئيس للحصول على درجة الدكتوراة في الفلسفة في التقنية ونظم المعلومات من جامعة ولونجونج، أستراليا.

الحكومة الألكترونية هي استخدام تكنولوجيا المعلومات لدعم وتطوير الانظمة الحكومية، مشاركة المواطنين مع الحكومة و تقديم خدمات حكومية شاملة وسريعة. إن شبكة الانترنت وتقنيات الويب 2.0 وخدمات الحكومة الإلكترونية اصبحت متاحة بشكل متزايد للمواطنين في أي وقت وأي مكان. ومع ذلك، لقد كتب القليل عن استخدام المواطنين المستمر لهذه الخدمات على مدى فترة من الزمن. لذلك، يهدف هذا البحث إلى تحديد العوامل الرئيسة التي من شأنها التأثير علي استمرارية استخدام الحكومة الإلكترونية من قبل المواطنين. سيتم هذا عن طريق نشر استبانة على الطلاب السعوديين الذين يدرسون في الخارج لمعرفة كيفية استخدامهم لبوابة الطلبة المبتعثين المقدمة من وزارة التعليم العالي.

مشاركتكم في هذا الاستبيان مهمة جدا لهذا المشروع البحثي، وذلك لأن نتائج هذا الاستبيان سوف تزيد من معرفتنا وفهمنا لكيفية تطوير خدمات الحكومة الإلكترونية وجعلها مفيدة للمواطنين.

لا توجد إجابة صحيحة أو خاطئة. الرجاء الإجابة على جميع الأسئلة. ما يهمنا هو وجهة نظركم بكل نزاهه وصراحة.

شكرا لأخذ الوقت لاستكمال هذه الدراسة.

مع أطيب التحيات،

جازم العنزي، بكالوريوس حاسب تربوي و ماجستير نظم معلومات
مرشح للحصول على الدكتوراة
قسم نظم وتكنولوجيا المعلومات
جامعة ولونجونج
استراليا

الرجاء اختيار الإجابة الأكثر ملاءمة للعناصر التالية

***1. الجنس**

- ذكر
- انثى

**2. العمر**

اذا

***3. المستوى التعليمي / اخر مؤهل تم الحصول عليه**

- ثانوية عامة
- دبلوم
- بكالوريوس
- ماجستير
- دكتوراه

**4. بماذا تستخدم الانترنت بشكل عام / مسموح اكثر من اجابه**

- [ ] البحث عن معلومات
- [ ] تصفح الانترنت
- [ ] التسوق
- [ ] البريد الالكتروني
- [ ] شبكات التواصل الاجتماعي
- [ ] قراءة الجرائد والمجلات
- [ ] خدمات مالية وبنكية

أخرى - حدد

**5. تقريبا كم مرة تستخدم الانترنت؟**

- مرة واحدة شهريا
- عدة مرات شهريا
- مرة واحدة اسبوعيا
- عدة مرات اسبوعيا
- مرة واحدة يوميا
- عدة مرات يوميا

**6. منذ متى و انت تدرس في بلد البعثه**

- أقل من سنة
- سنة واحده
- سنتان
- ثلاث سنوات
- أربع سنوات
- خمس سنوات
- أكثر من خمس سنوات

Page 2

***7. أفضل استخدام الطرق التالية لانهاء معاملاتي الحكومية**

- ◯ الاتصال الهاتفي
- ◯ وجها لوجه
- ◯ البريد العادي
- ◯ البريد الالكتروني
- ◯ استخدام بوابة الطلبة المبتعثين

***8. أفضل استخدام الطريقة التالية عند مواجهتي اي مشكلة ببوابة الطلبة المبتعثين**

- ◯ الاتصال الهاتفي
- ◯ وجها لوجه
- ◯ البريد العادي
- ◯ البريد الالكتروني
- ◯ استخدام بوابة الطلبة المبتعثين

**9. ماهي اكثر خدمة تستخدمها من قائمة بياناتي في بوابة الطلبة المبتعثين**

- ◯ البيانات الشخصية
- ◯ البيانات الدراسية
- ◯ بيانات الاتصال
- ◯ المرافقون
- ◯ المؤهلات الدراسية
- ◯ التقارير الدراسية
- ◯ بيانات جواز السفر
- ◯ تحديث الملف الالكتروني

**10. ماهي اكثر خدمة تستخدمها من قائمة الخدمات الشخصية في بوابة الطلبة المبتعثين**

- ◯ متابعة الطلبات
- ◯ تنبيهات
- ◯ طلب تذكرة سفر
- ◯ طلب استفسار
- ◯ طلب مكافأة تميز
- ◯ طلب الحاق مرافق بعضوية البعثة
- ◯ طلب اجازة
- ◯ طلب تعريف

**11. ماهي اكثر خدمة تستخدمها من قائمة الخدمات المالية في بوابة الطلبة المبتعثين**

- ◯ كشف حساب
- ◯ الحساب البنكي
- ◯ طلب ضمان مالي
- ◯ طلب تعويض

**12. ماهي اكثر خدمة تستخدمها من قائمة الخدمات الدراسية في بوابة الطلبة المبتعثين**

- ◯ طلب ترقية بعثة الى مرحلة اعلى
- ◯ طلب حضور مؤتمر او ندوة
- ◯ تمديد بعثة
- ◯ تغيير جامعة / كلية
- ◯ تغيير تخصص
- ◯ تأجيل بعثة
- ◯ انهاء بعثة
- ◯ طلب دورات تدريبية
- ◯ طلبات عامة
- ◯ طلب رحلة علمية
- ◯ طلب استمرار في دراسة اللغة
- ◯ طلب انتقال من دولة
- ◯ طلب تعديل تاريخ بداية بعثة
- ◯ طلب تعديل تاريخ نهاية بعثة
- ◯ طلب فتح ملف لمرافق دارس
- ◯ طلب تغيير معهد اللغة
- ◯ طلب تنقلات علمية
- ◯ طلب تغيير جامعة / كلية و التخصص

***13. في الثلاثة اشهر الاخيرة تقريبا كم مرة تستخدم بوابة الطلبة المبتعثين**

- ◯ مرة واحدة
- ◯ مرتين
- ◯ ثلاث مرات
- ◯ اربع مرات
- ◯ خمس مرات
- ◯ ست مرات
- ◯ سبع مرات واكثر

**14. تقريبا كم مرة استخدمت بوابة الطلبة المبتعثين اخر ثلاثة اشهر**

- ◯ مرة واحدة
- ◯ مرتين
- ◯ ثلاث مرات
- ◯ اربع مرات
- ◯ خمس مرات
- ◯ ست مرات
- ◯ سبع مرات واكثر

***15. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | لا اوافق بشدة | لا اوافق | لا اوافق نوعا ما | محايد | موافق نوعا ما | موافق | موافق بشدة |
|---|---|---|---|---|---|---|---|
| انوي انجاز معاملاتي باستخدام بوابة الطلبة المبتعثين وعدم انجازها بطرق اخرى | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| انوي استخدام بوابة الطلبة المبتعثين بشكل متكرر | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| بشكل عام انوي استخدام بوابة الطلبة المبتعثين | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

***16. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | لا اوافق بشدة | لا اوافق | لا اوافق نوعا ما | محايد | موافق نوعا ما | موافق | موافق بشدة |
|---|---|---|---|---|---|---|---|
| سوف استمر في استخدام بوابة الطلبة المبتعثين لانجاز معاملاتي | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| انوي الاستمرار في استخدام بوابة الطلبة المبتعثين | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| انة من المهم لي ان استمر في استخدام بوابة الطلبة المبتعثين | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| انا ملتزم باستخدام بوابة الطلبة المبتعثين | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

***17. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | موافق بشدة | موافق | موافق نوعا ما | محايد | لا اوافق نوعا ما | لا اوافق | لا اوافق بشدة |
|---|---|---|---|---|---|---|---|
| بشكل عام انا راض عن استخدام بوابة الطلبة المبتعثين | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| اشعر بالرضى حيال مجمل تجربتي في استخدام بوابةالطلبة المبتعثين | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| بشكل عام انا راض عن خدمات الحكومة الالكترونية السعودية التي تتضمن العديد من البوابات الالكترونية الحكومية بجانب بوابة الطلبة المبتعثين | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

***18. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | موافق بشدة | موافق | موافق نوعا ما | محايد | لا اوافق نوعا ما | لا اوافق | لا اوافق بشدة |
|---|---|---|---|---|---|---|---|
| اشعر بالرضا عند استخدامي لبوابة الطلبة المبتعثين | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| اشعر بالغضب عندما افكر انني سوف استخدم بوابة الطلبة المبتعثين | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| اشعر بالاستياء عندما افكر انني سوف استخدم بوابة الطلبة المبتعثين | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| فكرة استخدام بوابة الطلبة المبتعثين تشعرني بالاحباط | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| استخدام بوابة الطلبة المبتعثين يشعرني بالسرور | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

***19. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | موافق بشدة | موافق | موافق نوعا ما | محايد | لا اوافق نوعا ما | لا اوافق | لا اوافق بشدة |
|---|---|---|---|---|---|---|---|
| استخدام بوابة الطلبة المبتعثين اصبح تلقائيا بالنسبة لي | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| استخدام بوابة الطلبة المبتعثين اصبح اختياري الطبيعي | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| عندما اريد انجاز بعض المعاملات فإن بوابة الطلبة المبتعثين هي الخيار الامثل | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

***20. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | موافق بشدة | موافق | موافق نوعا ما | محايد | لا اوافق نوعا ما | لا اوافق | لا اوافق بشدة |
|---|---|---|---|---|---|---|---|
| استخدام بوابة الطلبة المبتعثين يمكنني من انهاء معاملاتي بدقة | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| استخدام بوابة الطلبة المبتعثين يزيد من انتاجيتي في انهاء المعاملات | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| استخدام بوابة الطلبة المبتعثين يزيد من فعالية اجراء المعاملات | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| استخدام بوابة الطلبة المبتعثين يجعل انجاز المعاملات سهلا | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

***21. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | لا اوافق بشدة | لا اوافق | لا اوافق نوعا ما | محايد | موافق نوعا ما | موافق | موافق بشدة |
|---|---|---|---|---|---|---|---|
| استطيع ايجاد جميع الخدمات التي احتاجها في بوابة الطلبة المبتعثين | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| تحتوي بوابة الطلبة المبتعثين على جميع الخدمات المطلوبة للطلبة | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

***22. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | لا اوافق بشدة | لا اوافق | لا اوافق نوعا ما | محايد | موافق نوعا ما | موافق | موافق بشدة |
|---|---|---|---|---|---|---|---|
| تجربتي في استخدام بوابة الطلبة المبتعثين أفضل مما توقعت | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| مستوى الخدمات في بوابة الطلبة المبتعثين افضل مما توقعت | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| بشكل عام توقعاتي عن استخدام بوابة الطلبة المبتعثين كانت في محلها | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

***23. الرجاء اختيار الزر الذي يعبر عن مدى موافقتك من عدمها على كل عبارة من العبارات التالية**

| | لا اوافق بشدة | لا اوافق | لا اوافق نوعا ما | محايد | موافق نوعا ما | موافق | موافق بشدة |
|---|---|---|---|---|---|---|---|
| المعلومات الواردة داخل بوابة الطلبة المبتعثين دقيقة | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| المعلومات في بوابة الطلبة المبتعثين محدثة | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| موقع بوابة الطلبة المبتعثين يصل بالشكل المطلوب بدون اي انقطاع او بطء | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| بوابة الطلبة المبتعثين توفر الخدمات الضرورية لاجرائها عن طريق الانترنت | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

## APPENDIX F: APPROVEL EMAILS FROM SAUDI CLUBS' PRESIDENTS

**RE: Survey support**
J. ALMLKI
**Sent:**Sunday, October 16, 2011 9:05 PM
**To:** Jazem AlAnazi

Dear Jazem,

We are happy to help you in your research. Regarding your survey, please send us your survey link and we will deliver it to all the club members who are willing to participate in surveys.

Best regards,

President of the Saudi students club in Adelaide

Jafar Almalki

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From
To:
Subject: Survey support
Date: Sun, 16 Oct 2011 06:50:29 +0000

Dear President of the Saudi students club in Adelaide,

I am a Saudi student conducting a survey as partial fulfillment of requirements for the degree of Doctor of Philosophy in Information systems and Technology at the University of Wollongong. My doctoral research aims to determine the factors that influence using e-government continually in Saudi Arabia and its potential benefits to both public-sector service delivery performance and users of e-services. It is hoped that the results of this study will facilitate Saudi government to increase its online services performance and to expose unseen problems.

The Ministry of Higher Education portal is one of the pilot sites that provide government electronic services to students. So, my research sample is the Saudi students who use the portal in Australia.

I will be grateful if you consent to support my research survey through the Saudi club to its members.

Thanks

Jazem Alanazi
Ph.D. candidate
University of Wollongong

## Re: Data Collection

Adel
**Sent:** Tuesday, October 04, 2011 2:42 PM
**To:** Jazem AlAnazi

Dear Jazem,

It's our pleasure to afford any kind of help to our students.

Regarding to your asking about distributing your survey to our members, we are so happy to help you in this matter.

Please send us a copy of your survey and we will work forward to deliver it to our members.

Best regards,

Adel Alyousef
Chairman of Saudi Students Association in Brisbane

0432661294
www.sscbrisbane.com

On 04/10/2011 1:24 PM, Jazem AlAnazi wrote:

> Dear President of the Saudi students club in Brisbane,
>
> I am a Saudi student conducting a survey as partial fulfillment of requirements for the degree of Doctor of Philosophy in Information systems and Technology at the University of Wollongong. My doctoral research aims to determine the factors that influence using e-government continually in Saudi Arabia and its potential benefits to both public-sector service delivery performance and users of e-services. It is hoped that the results of this study will facilitate Saudi government to increase its online services performance and to expose unseen problems.
>
> The Ministry of Higher Education portal is one of the pilot sites that provide government electronic services to students. So, my research sample is the Saudi students who use the portal in Australia.
>
> I will be grateful if you consent to distribute my research survey through the Saudi club to all its members.
>
> Thanks
> Jazem Alanazi
> Ph.D. candidate
> University of Wollongong

**Re: Survey distribution**
النادي السعودي في ارميديل
**Sent:**Monday, October 10, 2011 12:35 PM
**To:** Jazem AlAnazi

Dear Jazem,

I am happy to offer my help to publish your research survey to all our club members in your behalf. Please send me the survey and I will distribute it.

Thanks,
President of the Saudi students club in Armidale

Saudi Club Australia
Alshammari Mohammed
+61 413822580

On 4 October 2011 16:47, Jazem AlAnazi wrote:

> Dear President of the Saudi students club in Armidale,
>
> I am a Saudi student conducting a survey as partial fulfillment of requirements for the degree of Doctor of Philosophy in Information systems and Technology at the University of Wollongong. My doctoral research aims to determine the factors that influence using e-government continually in Saudi Arabia and its potential benefits to both public-sector service delivery performance and users of e-services. It is hoped that the results of this study will facilitate Saudi government to increase its online services performance and to expose unseen problems.
>
> The Ministry of Higher Education portal is one of the pilot sites that provide government electronic services to students. So, my research sample is the Saudi students who use the portal in Australia.
>
> I will be grateful if you consent to distribute my research survey through the Saudi club to all its members.
>
> Thanks
> Jazem Alanazi
> Ph.D. candidate
> University of Wollongong

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**النادي السعودي بارميديل**
لطلب الاشتراك او لإلغاء الاشتراك إرسال علي ايميلsaudiclubarmidale@gmail.com

**RE: Survey support**
Mohammed Aljuaid
**Sent:**Sunday, October 16, 2011 7:42 PM
**To:** Jazem AlAnazi

Dear Jazem,

I am pleased to offer my assist to your research. About your survey, you can send me your survey link anytime.

Best regards,

--
*Mohammed Aljuaid*
Saudi Students Association President
Toowoomba QLD 4350
P.O.Box 338 Darling Heights
Phone: +61 422 249 362

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From:
To
Subject: Survey support
Date: Sun, 16 Oct 2011 07:47:33 +0000

Dear President of the Saudi students club in Toowoomba,

I am a Saudi student conducting a survey as partial fulfillment of requirements for the degree of Doctor of Philosophy in Information systems and Technology at the University of Wollongong. My doctoral research aims to determine the factors that influence using e-government continually in Saudi Arabia and its potential benefits to both public-sector service delivery performance and users of e-services. It is hoped that the results of this study will facilitate Saudi government to increase its online services performance and to expose unseen problems.

The Ministry of Higher Education portal is one of the pilot sites that provide government electronic services to students. So, my research sample is the Saudi students who use the portal in Australia.

I will be grateful if you consent to support my research survey through the Saudi club to its members.

**Re: About distributing a research survey**

President
**Sent:** Monday, October 03, 2011 3:09 PM
**To:** Jazem AlAnazi

Dear Jazem,

We are glad to inform you that we are ready to offer all the necessary help to distribute you research survey through the Saudi club to all its members. All you need is to give us the survey link and we will send it to our members.

Regards,

President of the Saudi students club in Wollongong

Sent from my iPhone

On 29/09/2011, at 3:29 AM, Jazem AlAnazi wrote:

> Dear President of the Saudi students club in Wollongong,
>
> I am a Saudi student conducting a survey as partial fulfillment of requirements for the degree of Doctor of Philosophy in Information systems and Technology at the University of Wollongong. My doctoral research aims to determine the factors that influence using e government continually in Saudi Arabia and its potential benefits to both public-sector service delivery performance and users of e-services. It is hoped that the results of this study will facilitate Saudi government to increase its online services performance and to expose unseen problems.
>
> The Ministry of Higher Education portal is one of the pilot sites that provide government electronic services to students. So, my research sample is the Saudi students who use the portal in Australia.
>
> I will be grateful if you consent to distribute my research survey through the Saudi club to all its members.
>
> Thanks
>
> Jazem Alanazi
>
> Ph.D. candidate
>
> University of Wollongong